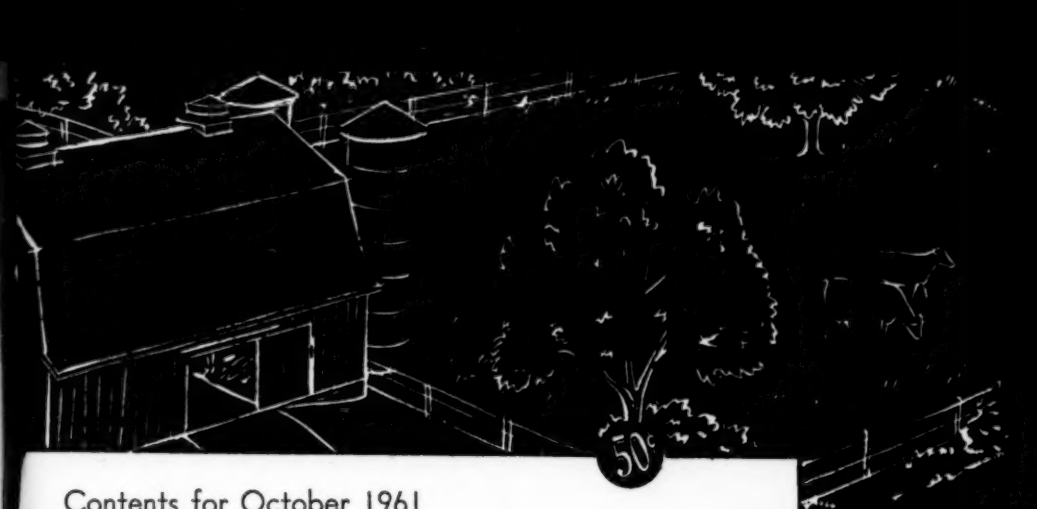

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The Farmer's Digest

Volume 25 October, 1961 Number 4

Public Relations — Our No. 1 Job

Too many of the farmer's customers are unhappy with him . . . and the feeling isn't going to change simply because criticism and hostility are unjust. It's up to us, as farmers, to set the record straight . . .

Condensed from The Progressive Farmer

Orville L. Freeman,
Secretary of Agriculture

EVERY farmer knows that the success of his year's work depends a lot on the weather.

He has seen his cotton "top-blooming," and the corn leaves curling up and losing their glossy green, because of drouth. He knows what happens to his crops when his fields get soggy wet and stay that way day after day; or when a flood tops the creek bank and sweeps across his ripening grain. He's seen frost blacken his fruit and vegetable crops, and 15 minutes of hail beat a year's hard work and some borrowed money into the ground.

If he's been farming long enough, he might remember a year or two when the climate was just about perfect. Rain and sunshine came at the right time, frost stayed off until hog-killing time, and the hailstorms didn't come.

Today the American farmer is learning—and must learn more—about another kind of "climate.'

This is the climate of public opinion. Right now it's nearly as dark and ominous as the hour before a tornado strikes. Much of the nonfarm public is critical of, even hostile toward, agriculture.

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The Progressive Farmer, 821 North Nineteenth Street, Birmingham 2, Alabama

More than a year's work and operating capital are endangered by this unfriendly climate of opinion. Agriculture's future is at stake. So is the nation's, for the withering of any segment of our economy is a drain on the growth of all other segments. Everyone depends on agriculture for his food, most of his clothing, some of his shelter. For the millions who market, transport, process, and retail farm products, who manufacture and sell farm supplies, agriculture is a regular paycheck or a dividend.

That's only half of this hard fact of interdependence. The other half is that everyone is a customer of the farmer's products.

And far too many of the farmer's customers are unhappy with him. Within the past few weeks, I've read charges that farmers are people who have chosen "to farm and complain," that the farmer is a "kept" man between wars.

This withering climate isn't going to change simply because the criticism and the hostility are unjust. It is up to us to set the record straight. There is a tremendouslv big and important job of public relations to be done. It is time for farmers and their organizations, for farm magazines, farm editors of newspapers, for the farm directors of radio and television, to talk a little less to agriculture and a great deal more about agriculture. It is time to tell the smashing success story of American agriculture to labor and industry, to business and professional men—in short to the consumer, the taxpayer, and the voter.

Agriculture has done, and is doing, a marvelous job. But agriculture hasn't bothered to give the facts to its customers.

The fact is that American farmers have achieved one of the truly great breakthroughs. They have abolished, here in America, one of mankind's oldest anxieties —the fear of hunger and famine.

The American consumer is better fed, and at lower real cost, than ever before. An hour's factory work buys much more farm food than it did 20 or 30 years ago. Wages from one hour of factory work in 1960 would buy 83% more round steak, 126% more milk, 138% more oranges, or 169% more bacon than in 1929.

In 1910, about 35 per cent of the American people lived on farms. Today, the number is down to 12 per cent.

The truth is that farmers are not getting the rewards that their great success deserves. They are not receiving the returns that skill, efficiency, and productivity bring to labor and capital elsewhere in our economy. Farm

workers last year received less than 82 cents an hour for their labor. The farmer received 12% less for the food he produced in 1960 than he did in 1947-49, while the cost of getting it to the housewife increased 36%. That's the real reason we pay 12% more for farm food than we did in 1947-49. By comparison, the cost of rent has gone up 43%; transportation, 46%; and medical care, more than 59%.

The fact is we have not learned to live with — to manage — our agricultural abundance. That is the crux of what is called "the farm problem." Too many have come to look on abundance as a burden, and not as the great blessing that it really is.

The solution can be found in giving to farmers the same kind of tools that nonfarm labor and capital have long used—the right of labor to bargain, the ability of industry to manage production.

This is the aim of this administration for agriculture, the goal of President Kennedy's far-reaching farm message to the Congress, the purpose of the recently introduced legislation to carry out President Kennedy's farm recommendations and bring decision making back to the grassroots.

Misunderstandings and misconceptions about agriculture, particularly among city people, can be big roadblocks to enactment of such practical farm legislation. We need the support of Congressmen representing the great metropolitan districts. In turn, these Congressmen must have the support of the voters back home—the city consumers, so many of whom are misinformed about agriculture and unaware of the direct relationship between the farmer's welfare and their own.

Once they have the tools to adjust production, farmers must be certain that the programs they build are good for the entire national economy — beneficial to their customers and the taxpayers as well as to themselves. More than that, farmers must do everything they can to make these new programs work—to participate in them as, apparently, corn and grain sorghum growers are participating in the 1961 Feed Grain Program.

A soil test will help take the guesswork out of buying and applying fertilizers. Don't guess, soil test.

This is the first essential of public relations for agriculture—doing a good job. The other essential is telling the public.

Arm yourself with the facts. Take these facts to your farm equipment dealer, your fertilizer distributor, your oil dealer, and others from whom you buy. Remind them how much you've

spent with them the last year, the past five years.

Tell them than American farmers spend $25 billion to $26 billion a year for goods and services to produce crops and livestock, and at least another $15 billion for the same things that city people buy. They spend $2.5 billion to $3 billion every year for tractors and other motor vehicles, machinery and equipment. Another $3.5 billion goes for fuel, lubricant, and upkeep of machinery and motor vehicles. The bill for fertilizer and lime is nearly $1.5 billion a year.

Talk with your banker. The accounts of his farm customers will show him whether agriculture in the county is keeping abreast of the rest of the local economy, slipping behind, or going deeper in debt.

See to it that your newspaper editor, and the program director of your radio and television stations get the facts. Enlist and encourage their help.

A membership in the local chamber of commerce or in one of the civic clubs is a good investment in public relations.

When you hear the constant complaining about the "high cost" of food, ask them to do a little checking for themselves. Do they know how much they spend at the grocery store for food, and how much for things they can't eat—for soap, detergents, paper, toothpaste, clothing, toys, towel racks, brooms, utensils and many of the other nonfood items?

Explain that the farmer isn't getting rich at the expense of the consumer. Last year he received only 39 cents out of each $1 spent for farm-grown food. The other 61 cents went for processing, transportation, corporation profits, labor, fuel, electric power, containers, advertising, and other costs after the food left the farm.

The farmer received 2.3 cents for the corn in a 26-cent box of corn flakes; 2.3 cents for the wheat in a 20-cent loaf of white bread; about 11 cents from a 25-cent quart of milk; 9 cents for the oranges in a 23-cent can of frozen orange juice.

To prevent loss of nitrogen in manure, apply super-phosphate at the rate of 2 pounds per cow per day in the stable gutter, or immediately before or after bedding in loafing or feeding pens.

Last year we spent only 20% of our disposable income for food. And we had a diet high in animal products—for each person an average of 161 pounds of beef, veal, pork, lamb, mutton; 35 pounds of chicken, turkey; 393 pounds dairy products.

When more of our city con-

sumers understand these and other facts, the climate of public opinion will be friendly to the idea that efficient family farmers deserve a parity of income and can achieve it without exploiting either consumers or taxpayers.

Feed Hogs Supplement

Farmers should continue feeding protein supplement to hogs turned into corn fields, Richard Hollandbeck, Purdue swine specialist, asserts. Most hogs turned in corn fields are fairly large, causing some producers to ask whether it will pay to feed protein supplement to these animals. A summary of 13 experiments conducted throughout the Corn Belt indicates that supplement will pay dividends.

Results of experiments show that pigs receiving supplement gained one-half pound more per head each day. Each bushel of corn produced 4.5 pounds more pork when supplement was fed. Each pound of supplement saved 6.4 pounds of corn.

—*Purdue Extension Service*

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC. REQUIRED BY THE ACTS OF CONGRESS OF AUG. 24, 1912, AND MARCH 3, 1933, AND JULY 2, 1946, of the Farmer's Digest, published 10 issues a year at Fort Atkinson, Wis., for October 1, 1961

State of Wisconsin
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Before me, a Notary Public in and for the State and County aforesaid, personally appeared Hugh Highsmith, who being duly sworn according to law, desposes and says that he is the publisher of the Farmer's Digest and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, and July 2, 1946, embodied in section 537, Postal Laws and Regulations, to wit:

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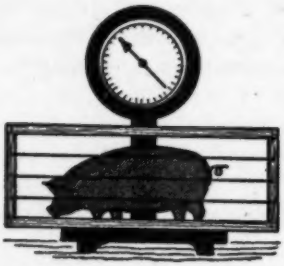
Signed, Hugh Highsmith, Publisher.

Jay P. Van Valin, Notary Public, January 24, 1965.

Sworn to and subscribed before me this 15th day of October, 1961. (Seal).

How To Get Started With SPF Pigs



It takes 6 weeks to clean up a farm, 10 months to grow new litters. Here's how to pay your bills in the meantime . . .

Condensed from Farm Journal

NOW that the "disease-free" program is rolling in many states, one of the big questions farmers are asking is: "What's the best and cheapest way for me to get started with SPF (Specific Pathogen-Free) pigs?"

The answers to this question came from farmers who had switched to SPF pigs.

The biggest cost of all for many hogmen is not the initial price of the SPF pigs but the loss of income while you're cleaning up the farm and waiting for your new gilts to reach farrowing age.

Three Illinois farmers solved it with the old idea of "going in together."

Eldon Johnson, Milton Oltmann and Ivan Miller of near Nokomis, Ill. didn't see any point to all three of them being out of hogs at once. So they made a deal whereby Johnson would grow out 50 new SPF pigs for all three farms, while Oltmann and Miller went ahead to finish one more crop of pigs.

Last March they ganged up to build for Johnson a slat-floored pen as a place to raise the pigs to 200 pounds weight.

They shared the labor in putting up this building and also shared the cost of feeding and caring for the new pigs. By September Oltmann and Miller had sold off their old herds, cleaned up for six weeks and were ready to restock with the pigs Johnson had raised.

"We were only out of hogs for six weeks," say Oltmann and Miller. And Miller used the extra time to build a new all-concrete finishing set-up and remodel a barn for a farrowing unit.

Another bonus for the three-farm combine is that they'll offer purebred SPF breeding stock in four breeds. Their farms are so close together that any buyer wanting to crossbreed can do his

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shopping right in one neighborhood.

Why Slat Floors off the Ground?

"Got the idea from Landhamp Ranch, Joplin, Mo., where Dr. R. B. Koger took the SPF pigs from our sows," says Johnson. He added, "I built one of my slat floors on runners so I can move it if necessary to clean under it. But the hogs were on it all summer and there's little build-up yet."

"Why don't you have to clean out the manure from under slat floors?" I asked Dr. Koger.

"The secret is ordinary earthworms!" he says. "Dr. Burton Graves, owner of Landhamp Ranch, bought $20 worth of worms to seed the ground under our slat floors."

Starting with SPF pigs is a cinch for a farm that has been out of hogs for a while. "We bought a new farm that hadn't had any hogs on it for some time," says Willard Dielschneider, Grundy County, Iowa.

He started with five purebred Hampshire litters delivered by Dr. Bert O. Combs, Conrad, Iowa. Dielschneider kept 11 boars and 21 gilts; paid Combs $48 each for them at four weeks of age. He's already sold seven boars for $200 each; thinks he'll have no trouble selling the gilts.

"First generation gilts will be the cheapest way for a lot of farmers to make the switch," reasons Dielschneider. "They'll only need to clean hogs off the farm for six weeks, then buy new, clean breeding stock. This way you aren't out of hogs as long as the man who starts from scratch with SFF pigs."

"What problems do you run into with hysterectomy pigs—what do you have to watch for?" we asked.

"When you get SPF pigs at four weeks of age and expose them to farm bacteria, they may suffer setbacks," says Willard. He advises:

1. Keep in touch with the vet.
2. Practice strict sanitation.
3. Keep pigs on concrete a month or more.
4. If you add new SPF pigs, keep them away from the older pigs.

To produce a bushel of corn, about 10,000 gallons of water are needed; 7,000 gallons for a bushel of oats, and 200,000 gallons for a ton of cured alfalfa hay.

What about short cuts to lower the cost of the SPF pigs?

"We've tried catching the pigs in a plastic sleeve or bag during natural birth and then raising them in brooders," says Dr. George Young, University of Nebraska, who perfected the SPF operation. "But we abandoned

the idea because it didn't keep the pigs from picking up disease organisms. Neither did placing hysterectomy-delivered pigs on just-farrowed first-generation gilts.

"Farmers should make sure they're getting what they're paying for when they buy SPF pigs," Dr. Young adds.

There are some 60 licensed groups now with 25 laboratories currently producing about 5,000 SPF pigs per month.

So a year from now, there should be a plentiful supply of SPF secondary (first generation) pigs. It's not too soon to start planning how you'll manage them if you're going to buy some.

Fertilizer On Pastures Pay

Every dollar intelligently spent on cultivated pasture fertilization will return from two to ten dollars, says George McBee at Texas A & M College.

Pastures, like all other crops, require adequate plant food, and a soil test is the best means of determining these requirements. A ton of grass hay contains about 30 pounds of nitrogen, 10 pounds of phosphoric acid and 30 pounds of potassium, while a ton of legume hay contains about 25 percent more of these elements. It is not uncommon to double pasture and meadow yields through good fertilizer management.

McBee warns against surface applications of nitrogen when there is not adequate soil moisture. Dry fertilizer containing nitrogen causes burning when applied to plants wet from dew or rain. With temporary pastures, it's best to band phosphate and potash into soil either at or ahead of planting, but in the case of permanent pastures they may be applied during renovation or cultivation.

Warm season grasses such as Bermuda or Dallisgrass may be fertilized either in early spring or in the fall. In the spring, fertilizer should be applied just before the plants begin growth, while in the fall, it should be applied during cultivation or renovation. McBee says 30 to 60 pounds of actual nitrogen per acre may be applied each time plants are grazed down, provided sufficient moisture is available for added plant growth. Cool season grasses such as fescue should be fertilized in early fall ahead of the growing season.

Properly fertilized pastures make it easier for stock to make economical gains, maintain body weight and avoid breeding or calving trouble.

—Texas A & M College

Price and Profit Prospects For Fall

Condensed from Livestock Outlook News

Reduced Demand Should Cut Costs Of Feeder Cattle

PRICES of feeder cattle this fall should be well under those of last fall. Higher feed costs are a certainty, and finished cattle are likely to bring no better prices in 1962 than they did this year. Most feeders should therefore buy at markedly lower prices than last year. Prices will finally depend on how optimistic cattle feeders are about the year ahead.

Supplies of feeder cattle are slightly larger than last year. The calf crop is estimated at 39,658,000 head, up 1 percent. The number of calves and steers on hand the first of this year was also up very slightly.

Feeder cattle prices will probably move more normally this fall than last, declining as the season progresses. During the first half of this year, prices of feeders stayed closer to last year's prices than did prices of fed cattle. This situation probably will not continue, although rising prices for slaughter cattle during the fall may provide some strength for the feeder market.

The sizable reduction in feedgrain crops and the losses that many cattle feeders sustained during the past year will probably lessen demand for feeder cattle. At the same time, severe drouth in the northern plains this year will make it necessary to move some cattle out. Prices of feeder cattle will therefore not be in as strong a position as last year.

There was little early contracting for future shipment of feeders from range areas.—*M. B. Kirtley.*

Hog Prices to Dip Less Than Usual In Fall of 1961

The monthly average prices of barrows and gilts in eight cornbelt terminal markets have been near or above $17 since May, 1960. They will probably trend downward for the remainder of the year, with the prices for October, November, and December averaging around $14 and $15.

Expected supplies of hogs during the first part of 1962 suggest an upward price trend with prices for barrows and gilts at terminal markets averaging $15.50 to $16.50. The last half of 1962 may

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see prices slightly weaker than in the same period this year.

The price of hogs is influenced by the hog production pattern, supplies of other red meats and poultry, the annual increase in population, and the level of consumer income.

The price-making factors other than hog production are discussed in other articles in this paper.

Pork production in the first six months of 1961 was about 5 percent below the first half of 1960. The 9- to 10-percent increase in pigs saved during April and May should result in a decided increase in pork production by October or November. This increase in production is the reason for expecting prices to be lower than in the closing months of 1960.

The auto is here to stay, but many motorists aren't.

Reported intentions for fall farrowings suggest that the number of pigs saved will be about 3 percent greater than a year ago. This small buildup may hold early-winter hog prices $1 to $2 lower than a year earlier.

Prices for the last half of 1962 will be tempered by 1962 spring farrowings, which are expected to be a little larger than in 1961.

From all indications, prices for the last half of this year may generally follow the trend of the favorable hog years, but at levels about $2 lower.—*R. B. Schwart.*

Price of Corn To Approach Support Level

The price of the 1961 corn crop seems likely to average about 15 cents higher than the average for the 1960 crop. The principal reasons for the higher prices are that (1) the new crop will be considerably smaller and (2) the price-support level will be higher.

The government will sell much more corn from CCC stocks in the year ahead than in the past 12 months. But these increased sales are not expected to offset the effects of the smaller crop and the higher price-support level.

The USDA in August estimated the 1961 corn crop, for grain only, at 3,352 million bushels, 14 percent less than last year. The reason for the smaller crop, is of course, the feed-grain program.

About half of the corn being produced in the corn belt will be eligible for price support. Most of the remainder will be fed to livestock on the farms where it is produced.

A key factor in the price of corn will be the amount purchased for domestic consumption and exports. Over the past four years such purchases have increased from about 1,000 million bushels to around 1,400 million bushels annually.

Purchases by domestic users and exporters will be large again in 1961-62. All four feed crops are small this year, while numbers of livestock and poultry are increasing. Many farmers will have to rely on purchased feed.

The principal sources of supply of this corn will be (1) the CCC and (2) farmers whose corn is eligible for price support at $1.20.

The CCC will sell large amounts of corn, but probably not enough to supply all needs. The market price is therefore expected to rise to a level that will cause some farmers to sell corn rather than put it under loan. This level usually is 5 to 10 cents below the support level.—*L. H. Simerl.*

Fed Cattle Prices to Hold in 1961 Range

Prices of fed cattle are likely to average about the same during the next 12 months as in the past year. The general trend in cattle numbers is up, but increased demand could offset slightly larger supplies of beef.

On January 1 the number of cattle on feed was 6 percent above that of a year earlier. In April that margin was down to 5 percent, and in July. to 2 percent.

The increase in July was in the midwest, where numbers were up 3 percent. In the western areas numbers were down 3 percent. Illinois had 5 percent more cattle on feed than a year ago.

Numbers of cattle weighing over 1,100 pounds were up 15 percent. The numbers in the largest weight group, those weighing 700 to 900-hundred pounds, were up 8 percent.

Marketings Up Slightly

Marketings of fed cattle during this fall will probably be only slightly larger than a year ago. With higher consumer incomes, the population increase, and less competition from broilers than during the past summer, fall prices should be about equal to or higher than those of a year ago. Choice steers at Chicago averaged $26.00 in the last quarter of 1960.

An experimental plot in Sanborn Field at the University of Missouri produced at the rate of 91 bushels an acre after having been in corn for the past 70 years.

Higher Lamb Prices In Year Ahead

Lamb prices are expected to average the same or a little higher in the next 12 months than in the past year. Higher prices could result from stronger consumer demand and reduced market supplies.

The 1961 U. S. lamb crop is officially estimated at 21,532,000 head, 1 percent more than last year.

The western states reported 14,248,000 head of lambs, 2 percent more than a year ago. Lambs from these states provide most of the market supply during the fall and winter.

The 1962 lamb crop appears likely to be smaller than that of this year. The reasons are that the number of ewe lambs on hand January 1 was down 11 percent from the year before, and slaughter during the first half of this year was 13 percent greater than it was a year before. These figures suggest that the number of ewes available for lambing in 1962 will be smaller than in this year.

Since slaughter of lambs has been unusually heavy this year, we have reason to expect that it may be lighter in 1962. This could help the market.

Business activity, which has been a little slow, seems likely to be better in the next 12 months, with consequent improvement in demand for lamb. —*L. H. Simerl.*

Soybean Price to Sag to Loan Level

In a nutshell, the soybean picture is one of an expanding market, but at a rate too small to absorb the large supply increase coming up this year. The result will be a carryover in the hands of CCC, which can be accumulated only at the loan price. By next summer the loan rate will act as a ceiling.

It is important to recognize that in spite of high prices for some soybeans during 1960-61, most of the crop moved at moderate prices.

The first official estimate of the size of the 1961 crop, issued on August 10, was 683 million bushels. This is up 22 percent from the 558 million bushels in 1960.

Nation-wide efforts to slim down overly fat hogs have led researchers into many lines of genetic and nutritional work to help do the job effectively.

The carryover of soybeans on October 1 will be much smaller than a year earlier — only 5 to 10 million bushels compared with 1960's 23 million.

The market not only will have to cope with this larger supply, but also with an increase in the price-support loan rate from $1.85 a bushel to $2.30. Oil and meal prices must be fairly high to justify $2.30 for soybeans.

Dairymen miss a chance to increase profits by failing to emphasize a first rate milking job, points out an extension dairy specialist. Quality forage, a good breeding program and disease control are important, but the actual harvesting of the milk is just as important, he says.

Is Your Beef Profit Picture In Focus

For a brighter, sharper future in beef cattle, take these steps . . .

Condensed from
Western Livestock Journal

To keep your profit picture in sharp focus you must be able to "roll with the punches" delivered by an ever-changing economy and an ever more unstable climate. Here's how, say University of California Extension Livestock Specialists, you may sharpen it:

- Increasing feed through range improvement.
- Changing the kind of beef you produce; ie. calves to yearling stockers, breeding herd to a smaller breeding herd plus stockers, or stocker feeders only.
- Adding facilities for feedlot finishing.
- Improve your efficiency via better breeding, feeding, higher calf crops, heavier selling weights.

Compare alternative plans under expected price and cost conditions to determine quickly and surely the most profitable way to use feed in beef production. Trial and error is slow and hazardous. Even if you develop a profitable production program, you must anticipate the need to change with changes in price differentials or feed supply. A yearly trial budget improves your chances for a good profit.

Make two or more plans for the coming year, or for the long pull. Figure probable income and expenses to arrive at the probable net income, or profit, from each plan. The plan which is most profitable on paper usually turns out to be most profitable in practice.

Experience Needed. Making plans and budgets in advance requires experience and judgment. Assume certain feed production, then estimate the kind and number of animals you will need to use this feed. Next, estimate calf crops, weaning weights, selling weights, and death losses. Figure income and costs by estimating cost items and probable selling prices. These estimates should be

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Western Livestock Journal, 4511 Produce Plaza, Los Angeles 58, Calif

based on observation and experience, with attention to current and near future price trends.

Cattlemen must sell their beef in competition with beef produced all over the west. They must produce efficiently the kind of beef best suited to convert and market their feeds.

There are three main stages in beef production:

The first stage — running a breeding herd to get weaner calves — takes a lot of feed and it must be cheap feed to allow a profit.

The second stage — growing the calf to a mature feeder — takes less feed per pound produced. Usually more profitable it can stand higher feed costs.

The third stage — finishing for market — usually requires a period in the feed lot, largely on concentrate feeds, but can be partially done on irrigated pasture with grain. It is profitable under good management, where the right feeds are available and an adequate price margin prevails.

The further an animal is carried with ranch grown feeds toward a popular slaughter grade, such as good or choice, the greater the profit potential.

If you buy feeders, allow a margin of about 1c per lb. between buying and selling price for each month of feeding required to make the grade you're shooting for.

You may improve the weight, grade, and price of cattle you sell by adding irrigated pasture . . . profitably.

Pre-test every step toward improving profit by making a plan and budget with and without the change. Estimate changes in costs and production, and income and potential profit under these assumed price and other conditions. Relative profit differences estimated in advance will be in the right direction, even though actual prices and ultimate profit cannot be forecast exactly.

Our destinies are decided not by chance, but by choice — our choice.

For a brighter, sharper profit picture take these steps:

1. List feeds produced, and estimate the quantity of each.

2. Look carefully to feed production to see if yields or grazing can be increased.

3. List grazing available by months, and study its distribution to see how it may be improved or shifted.

4. Select a kind of beef production and number of animals to try in a plan to fit the feed supply.

5. Work out your first plan, adjusting and changing it until it is a good compromise between what is feasible and a perfect fit.

6. Complete a budget of expenses, income, and profit.

7. Make several different plans to fit the same conditions and feed supply.

8. Make and test the final plan with a budget.

9. Work gradually toward your final plan.

10. Revise plans annually to fit changing price and feed conditions.

11. Keep full production and financial records so that planning ahead will be easy and accurate.

Big Corn Harvest May Foil Federal Glut Cutting Hopes

The Government paid farmers about $700 million this year to idle 20 million acres of corn land, holding plantings 18% below 1960. Aim was to hold the harvest below consumption needs, lure grain out of Government surplus holdings. But farmers planted corn on their best land, planted more seed per acre and used more fertilizer. Weather has been nearly perfect.

So the crop is now officially estimated at 3,520,000,000 bushels, 344,000,000 above the July 1 forecast and only 10% below 1960. Grain men say domestic and export needs in the crop year starting October 1 probably will about balance this bumper output. The latest estimate of corn use in 1960-61 is a record 3,650,000,000 bushels, but farmers now probably will feed their animals more soybean meal, because of this year's huge soybean crop, and hold back on corn.

Uncle Sam's corn pile has been mounting since 1952. The Government now has over $3 billion tied up in surplus corn, or over $16 worth for every person in the U. S. —*Wall Street Journal*

When crops are properly fertilized, everything goes better—including insecticides. A Colorado entomologist says it may be possible to boost the effectiveness of insecticides by as much as 100% through the proper use of fertilizers. In first-year studies, he found that apples from fertilized trees had only half as many worms as those from unfertilized trees in four out of six treatments.

Corn roots in fields where fertilizer had been applied went seven feet deep in search of moisture during a dry year in Iowa, while unfertilized roots went only four to five feet deep.

Herd Is Larger, But Chores Easier

There's little "outside" choring in this well-planned but low cost dairy setup . . .

Condensed from The Farmer

Thomas A. Doughty

Too much work per cow, not enough room and an old barn nearing collapse were reasons enough for Adolph Annexstad and son, Ingvald, to build a new, modern, well-planned dairy setup on their 229-acre farm in Nicollet County, Minn.

For a $14,419 investment, here's what they got:

- A 40 x 60-foot, pole-type hayshed, enclosed with galvanized sheet metal—to store 4,000 bales of hay, with a connection to the new barn via a vestibule at one corner so hay can be carted directly to cows and calves at ground level in winter, or self-fed in a hay bunk along one side of the shed during the summer.

- A 34 x 70-foot, concrete-block, one-story barn, equipped with 30 comfort-type stalls, gutter cleaners, watering cups, electric cow trainers, glass-block windows, insulated walls and ceiling, and ventilating fans.

- A 20 x 40-foot concrete-block calf barn, adjoining the cow barn at a right angle. Built to minimize the work load, it has a wide door at the south to permit entry of a tractor and wagon or spreader. Like the cow barn, it is insulated, ventilated and has glass-block windows and piped-in water. Individual stalls are planned for.

- A 14 x 16-foot concrete-block milkhouse that meets grade A standards. The milkhouse is attached to the barn, but separated from it by a double-door vestibule.

That's good return for money spent. But there is more.

In addition to the obvious advantages of time and labor saving, and of providing space to handle 30 cows, in place of the 19 they had before, several other features of the Annexstad's dairy setup make it especially desirable, points out Dennis Ryan, extension agricultural engineer, Un-

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iversity of Minnesota, who helped with the planning.

First, all daily chores are done under cover, with minimum effort. There's no walking between buildings outside to handle feed, silage, hay, or the milk. And best use was made of existing equipment. A 14 x 30-foot tile silo, for example, was left in place in the layout plan.

To feed baled hay, the Annexstads simply roll a flat-bottomed cart, on casters into the vestibule separating barn and hayshed. Few steps and little lifting are required to load the cart with enough bales to feed the two lines of cows, each line facing out. The route of the hay cart, from vestibule and around the barn in front of the cows, is all on one level—no slopes to climb.

Enough straw to bed the cows several days also is stored in one corner of the hayshed, along with the cart which is used to distribute it. Additional straw is stored in a hogbarn loft, from which it can be hauled by the wagonload to the hayshed as storage room permits.

Feed Tank Coming

A metal holding tank for bulk, ground, complete-mixed feed soon will be placed next to the barn. An auger tube will convey this feed directly into a cart for distribution. At present, this feed is stored in a small building, next to the barn.

"Once the feed and silage carts are full, it takes but 15 minutes to feed 30 cows," said Ingvald. "The barn cleaner makes a complete round in seven minutes. So, feeding and cleaning are no longer time-consuming jobs on our farm."

The Annexstads studied a number of new dairy barns before building their own. "The pointers we picked up, plus the planning help from Mr. Ryan, saved us money, both in construction costs and now in operational costs," said Adolph. "From the old barn, we also salvaged a lot of dimensional lumber, still in good shape. Much of this was used for rafters, roof boards and sill work, which reduced our material costs considerably.

He who is best educated can be the most useful.

"We are well satisfied with the temperature and humidity control in the barn," he added. "We've had no moisture on walls or ceiling, either in winter or summer, and the barn is cool in summer and warm enough for comfort in winter."

The double barn walls have 4-inch concrete blocks on the inside, then an inch of insulation between this wall and the outer wall, which is of 6-inch concrete block. The ceiling has two inches

of blanket insulation above the fireproof ceiling boards.

Louvres in the peak ends of the attic allow fresh air to enter, warm up, then flow downward into the barn through a ¾-inch slot opening between the ceiling and walls.

As this air enters from the attic, it picks up moisture from the barn, then flows out through the ventilating fans. A ten-inch fan runs continuously. A larger, 26-inch fan kicks in only when the moisture and temperature load is too great for the small fan. It is thermostatically set between 42 and 48° F. In summer, doors and windows remain closed most of the time.

"This keeps the fans going most of the time in summer," explained Adolph. "The cost is not great. Our electric bill since building the new barn has increased only about $1.50 a month, and we've added the barn cleaner, cow trainers and the fans."

Inside walls are painted with moisture-proof paint—the upper half and ceiling is white and the lower half of the walls a dark green to show less stain. There are 14 glass-block windows (30 x 40 inches) evenly spaced along the four walls of the barn.

Stalls are 4 feet wide, 6 feet long; mangers 21 inches wide, and the feed alley at the front is 3 2/3 feet wide. The manger curbing is 11 inches high on the cow side (5 inches wide) and 5 inches high on the feed alley side. The manure gutters are 16 inches wide and 14 inches deep on the cow side, 11 inches deep on the gutter alley side. The gutter alley is 6 feet wide. The stall platform slopes 1 inch to 18 inches at the front, which aids in holding bedding in place beneath the front of each cow.

Outside the barn, there are lights to illuminate the yard in all four directions, as needed. The cows walk from the lot up concrete steps to get into the barn. The outside barn cleaner conveyors, one for each gutter, are placed at a right angle to the east wall, instead of projecting into the lot where they would be in the way of hay being hauled to the hayshed.

Of the $14,419 out-of-pocket material and labor costs for their new dairy setup, finished 1½ years ago, the Annexstads paid $2,400 for the hayshed, $9,169 for the cow barn, calf barn and milkroom, $550 for wiring, and $2,300 for new equipment. This does not include their own labor, lumber salvaged from the old barn, or existing equipment.

The average American is eating more vegetables today than did his ancestors of 50 years ago. There has been a shift away from fresh processed vegetables.

Started Lambs . . .
Newest Concept In Sheep Raising

A better product and higher profits are seen . . .

Condensed from The Shepherd
Dr. R. M. Jordan, Univ. of Minnesota

SEVERAL critical periods of sheep management exist from the time a lamb is conceived until it is profitably sold.

Each period calls for a little different type of skill and knowledge on the part of the sheepman. Can we expect one individual to possess all the knowledge and talent necessary to do a top job during each of these periods? If he does, it means that he has the necessary knowledge to: (1) Obtain a 150-185% lamb crop; (2) Economically winter ewes, and at the same time be assured of a heavy wool clip, strong lambs at birth, ample milk supply from the ewes and a minimum of trouble with pregnancy disease, foot rot, pneumonia and a host of other problems. (3) This one man's talents and skills would include the desire and devotion to the job to insure a minimum of lamb loss during the lambing season. (4) He must know how to creep-feed lambs so that they would gain .7-.9 pounds a day and his parasite and pasture program would be reasonably fool-proof. The result: 90-100 pound lambs in 120 to 150 days. Are we expecting too much from one individual? We have all seen the sheepmen who had an excellent lamb crop. His lambs do very well while in drylot, only to run into unsurmountable difficulties due to a poor pasture program and parasites.

Just as often there are sheepmen who can put gains on lambs rapidly either in drylot or on pasture, but they fall by the wayside dollarwise because their lambing percentage was low, their cost of wintering the ewe too high, or, in some cases, they may have tried to economize on the wintering to the degree that the ewes were thin and had little milk, and therefore many of the lambs were lost during the lambing season.

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These general introductory remarks lead up to the question that perhaps sheepmen should be asking themselves, particularly in view of the declining number of feeder lambs from the West. Should all sheepmen attempt to take part in the entire production picture or should they specialize and do only that part of the job that they are able to do best?

Farm flock specialization could be broken down into two categories: 1) the sheepman who maintains the ewe flock, lambs out the ewe and grows the lambs to 40 or 50 pounds; the second phase would be taken over by someone else in the area who has the particular talent and the type of farm enterprise (such as a corn-bean producer) that a lamb feeding enterprise would naturally complement. This latter farmer would purchase the 40 or 50 pound early weaned and "started" lamb to complete the production picture. For this type of specialization to succeed, there would have to be a chance for profit for the man who feeds out the lamb as well as for the man who produced the lamb and grew it up to the 40 or 50 pound weight.

Let us assume that a lamb producer, under our present system, has 120 lambs from 100 ewes. He grows these out to approximately 40 to 50 pounds in weight. When these are turned out onto pasture with their mothers they may or may not be continued on a creep feed. When fall rolls around, on the average this producer has suffered a 2-5% death loss due to bloat, maggots, and a number of other mishaps. Therefore, one should recognize that there is a certain amount of death loss sustained by the grower after his lambs go to pasture. Nor is this all. The biggest loss the producer sustains after the lambs go to pasture is the poor weight gains obtained by many, and perhaps most farm flock producers. Unless this were true, would it be possible to buy native feeder lambs during the months of October to January that weigh 70 to 80 pounds?

Agriculture stands with one foot in space, the other on the Stone Age.

Let us assume that 12 lambs can be pastured to the acre at a pasture cost of $1.50 per lamb. One would then receive land rental of about $18 an acre. If only two lambs out of the 120 lambs died during the grazing season, the pasture costs for the remaining 118 would amount to $177.00.

A comparison of "net return" when lambs are sold at various weights in the fall with the "net return" if one were to sell these lambs as 40 to 50 pound feeder lambs (Table 1) suggests that the

118 lambs would have to weigh about 75 pounds and sell for 18c a pound in order to return the same "net return" as 120 lambs sold when they are 40 or 50 pounds at $12 a head. If one could sell his early-weaned lambs for $13 a head they would return slightly more money than 118 lambs sold at 80 pounds. It would appear then that the sheepman who does just a mediocre job in growing out his lambs and often sells them as feeder lambs late in the fall at low prices may actually realize as much or more money selling them early in the summer at so much per head. This is the practice some swine producers now follow who produce 20 to 40 pound feeder pigs and it is proving to be a profitable one.

Would a 50 pound lamb at $10-$12 per head leave sufficient profit for the feeder? It would certainly seem so. We may assume that if the lambs are grain fed by a good feeder in drylot they would be ready for sale at least 60 days sooner than if they were continued on grass. Hence, they would normally sell for the substantially higher prices that prevail in our markets earlier in the season before the big flush of western lamb is ready. Furthermore, these young feeder lambs, if they are fed properly, would gain .5-.7 pounds a day and therefore if properly bought, should return to the commercial lamb feeder as much or more profit as the current feeder lamb that he is now buying and finishing. He would be obtaining his weight gains at a more economical period of the lamb's growth.

TABLE 1. COMPARATIVE RETURNS FROM SELLING 40-50 POUND EARLY WEANED FEEDER LAMBS WITH RETURNS FROM SELLING LAMBS IN THE FALL.

No lambs	Av. sale weight	Total sale, lbs.	Price/ lb.	Total gross income	Added past. cost*	Net income less pasture cost
118	65	7670	18c	$1380.60	$177.00	$1203.60
118	70	8260	18c	$1486.80	$177.00	$1309.80
118	75	8850	18c	$1593.00	$177.00	$1416.00
118	80	9440	18c	$1699.20	$177.00	$1522.20
118	85	10030	18c	$1805.40	$177.00	$1628.40
118	90	10620	18c	$1911.60	$177.00	$1734.60

SOLD AS FEEDER LAMBS AT 40-50 LBS.

120 at $11/head, $1320.00
120 at $12/head, $1440.00
120 at $13/head, $1560.00
120 at $14/head, $1680.00

*The $177 added pasture cost is the charge made against the pasture eaten by the lambs.

Said in another way, this proposition could be good for both lamb producer and feeder. The lamb producer would be able to run more ewes, and therefore produce more feeder lambs, having more adequate pasture available for that purpose. The feeder would be able to market the lighter-weight, meatier type of lamb that the public now demands.

Obviously, the profit from feeding the lamb out should be made by the man who produced it. The point is, too many of our sheepmen don't feed their lambs well enough so that there is any profit at all.

If you are the kind of operator that is producing 90-95 pound market-topping lambs when they are 4 to 6 months of age, regardless of whether they are produced in drylot or an excellent pasture, then this proposal is not for you. On the other hand, if you have a pasture problem, or a parasite problem that results in light feeder lambs or in your keeping them on the place until they are 9-12 months of age (and "mutton"), then perhaps you should begin to look around in your area for farmers who are situated in respect to available feed and equipment to do the job that you cannot do. If you can produce heavy lamb crops and grow them out quickly to 40-50 lbs. before pasture-time—the key to a successful operation for you might well be: STARTED LAMBS.

Soybean Price In Government Hands

Higher support prices, a record-sized crop and a huge oil surplus means that soybean prices in the year ahead will greatly depend on government actions, a University of Illinois agricultural economist believes.

T. A. Hieronymus reports that the 1961 feed grain program and a higher support price of $2.30 a bushel have boosted the soybean supply for the coming year about 25 percent over a year ago. He feels that the market cannot absorb this many more soybeans in one year with the price support of $2.30.

So the result will be an accumulation of beans in the commodity Credit Corporation stockpile. The amount that the government wants to stockpile will determine what action will be taken to dispose of oil and meal through subsidied export programs.

—University of Illinois

Fertilizer May Be A Good Substitute For Other Resources

Increasing farm size isn't always the answer.

Condensed from Arkansas Farm Research
Daniel F. Capstick, Joseph L. Keogh and *Richard Maples,* Agronomists

INDIVIDUALS managing a farm business are interested in the possibility for increasing net farm income. This can be done by alternative methods. Two such methods are (1) increasing farm size by using more resources and (2) reducing production cost per unit for the same total output.

Farm size is usually increased by acquiring more land. However, this need not be the case because certain other factors, such as machinery, labor, fertilizer, etc., can be substituted in part for land. Substituting other resources for land becomes especially important when additional land resources are not available.

Reducing production cost per unit of output usually results from a change in technology. However, many technological developments that may lower per unit costs require more resources and are output increasing. An example would be the adoption of a fertilization program compared with a previous production method without fertilization.

This report evaluates the possibility of increasing net farm income by applying the technique of increasing farm size by use of a non-land resource such as fertilizer. The data used are based on a recent grain sorghum fertilization study conducted by agronomists in eastern Arkansas during 1958 and 1959.

An economic analysis of the data indicates that the optimum level of fertilization for grain sorghum in the area is approximately 70 lb. nitrogen per acre if nitrogen is $0.12 per pound and grain is $2.00 per cwt. Further analysis shows how nitrogen can

Reprinted from Arkansas Farm Research, University of Arkansas, Fayetteville, Arkansas

be substituted for other resources and at the same time reduce production cost per unit of output.

A mathematical function fitted to the data results in an average yield of 2,638 pounds of grain per acre without nitrogen and 4,336 pounds when 70 lb. nitrogen is used. This is an increase of 1,653 pounds of grain per acre due to fertilization. The cost of producing 2,683 pounds per acre without nitrogen was $31.96, or $1.19 per cwt. of grain (Table 1 at end of article). The cost of producing 4,336 pounds of grain per acre with 70 lb. nitrogen amounted to $47.37, or $1.09 per cwt. Returns to management were $21.70 per acre without nitrogen compared with $39.35 per acre when nitrogen was used. Thus, returns to management were increased $17.65 per acre by application of 70 lb. nitrogen.

A reckless driver is one who passes you on the highway in spite of all your car can do.

Although fertilizer competes with other productive resources for the limited capital a farmer has to invest, farm operators should recognize that it also substitutes for certain other factors. In the production of grain sorghum, fertilizer can be an effective substitute within limits for land, seed, machinery, and labor.

In producing 4,336 pounds of grain per acre with 70 lb. nitrogen other resources are reduced by a substantial amount as compared with producing the same quantity of grain without nitrogen. The 70 lb. of nitrogen substitutes for $8.68 in interest; taxes, and other costs of 0.62 acre of land; 3.1 pounds of seed worth $0.25; and $4.15 in machinery cost, and it saves 1.6 hours of labor worth $1.20 (Table 2). Thus, the $9.90 spent for fertilization substitutes for $14.28 of other resources in producing the additional grain. This results in a net cost advantage from substitution of $4.38.

Another aspect of fertilization is the effect on net income. Net returns are 1.81 times greater per acre for the fertilized grain as compared with the non-fertilized grain. This means that 100 acres of grain would yield the same net farm income after fertilization as 181 acres did prior to adoption of an adequate fertilization program.

Most things seem to come to those who wait—on themselves.

Nitrogen can be an effective substitute for land and other resources in the production of grain sorghum as long as the additional cost resulting from fertilization is less than the value of resources replaced.

TABLE 1. Estimated Cost and Returns of Producing 1 Acre of Grain Sorghum With and Without Nitrogen

Item		Price or Unit cost	Without nitrogen Amount	Without nitrogen Value	With nitrogen Amount	With nitrogen Value
Grain production	Cwt.	$ 2.00	26.83	$53.66	43.36	$86.72
Inputs						
Land	Acre	14.00*	1.00	14.00	1.00	14.00
Seed	Lb.	.08	5.00	.40	5.00	.40
Machinery & equip.**	$	—	—	6.69	—	6.69
Labor**	Hours	.75	2.57	1.93	2.57	1.93
Harvesting	Acre	1/6***	53.66	8.94	86.72	14.45
Nitrogen	Lb.	.12	—	—	70.00	8.40
Nitrogen application	Acre	1.50	—	—	1.00	1.50
Total cost				31.96		47.37
Returns to management				21.70		39.35

*Value of land estimated at $200 per acre with an annual cost of 7% which allows for interest and taxes.

**Assuming 4-row equipment.

***The custom rate used is one-sixth of the grain delivered to the elevator.

TABLE 2. Amount and Value of Other Resources Nitrogen Can Be Substituted for in Producing 4,336 Lb. of Grain

Item	Unit	Amount*	Cost	Value
Land	Acre	.62	14.00	$ 8.68
Seed	Lb.	3.10	.08	.25
Machinery & equipment	$	—	—	4.15
Labor	Hours	1.60	.75	1.20
Total cost replaced				14.28
Added cost of fertilization				9.90
Net gain from substitution				4.38

*Equivalent to 0.62 times the respective amounts of producing 2,683 pounds (4,336 divided by 2,683 equals 1.62) of grain without nitrogen (Table 1).

If the U.S. is to have the timber it needs in 40 years from now, now is the time for planting trees, says E. P. Farrand, Penn State forester. The key to adequate future timber supplies lies with small timber land owners such as farmers, businessmen, and retired people, who own most of the commercial forest lands.

Bees — How To Manage Them On Your Farm

You can keep bees for profit . . .

Condensed from Missouri Ruralist

ON MANY farms there are a few hives of bees setting in fence corners and other places that are useless because of neglect.

With only a little outlay these bees can be made into a valuable asset. Bees do a great deal more good for agriculture than they are given credit.

Fruit farmers will pay up to $5 a colony for bees to set in apple orchards during fruit blooms, and some farmers will agree to divide the seed crop of red clover if the beekeeper will place his bees in his field at blooming time. Melons and all berries are greatly benefitted by bees carrying pollen from one flower to another. Why do bees avidly seek out pollen-bearing flowers? Because pollen is their bread—half their living with nectar from the flowers the other half. Moreover, young bees cannot be reared in the absence of pollen.

Then what's the matter with neglect? Won't they hustle for themselves? So will a pig if you turn him out.

When spring comes the bees that have brought the colony thru the winter are old and worn to near exhaustion with their numbers badly scattered. Their first duty is to rear young to replace their numbers. This they cannot do until warm weather brings the elms and maples and dandelion into bloom to supply the necessary pollen. With pollen coming in, the queen begins to lay her eggs. Next it takes 21 days for her eggs to hatch and another 10 days for the young bees to fill out into worker bees. By the time all of this is done the apples and peaches are out of bloom. By the end of the apple bloom the queen

Reprinted by permission from Missouri Ruralist, Fayette, Missouri

has hatched out and matured one cycle of brood.

Many Cycles Occur

The queen will keep on with her egg laying while this cycle is out hustling food to feed the second cycle for which the queen is laying eggs. By the time this cycle is mature, berries and such sources of pollen and nectar will be out of bloom. Now you have bees and no honey but the bees you now have will pitch in and rear a big third cycle that comes on in time to be reared on the main clover flow, again defeating any chance of a honey crop. By the time it comes on our queen is laying from 1,000 to 1,500 or more eggs a day. Then, 21 days later you will have from 1,000 to 1,500 new bees every 24 hours. In a week's time there will be 10,000 new bees to be fed and matured. By the time this is done, our bees will have visited every flower for miles around and fed it all to these young ones.

Now, what good have your bees done? Every cycle has been reared on the early and main honey flows, and all you have is a bushel basketful of bees and not a single drop of honey for yourself. Your bees are now worthless because the honey flows are over, and all fruit and seeds have been set. All you get from now on is a lot of stings from hungry, frustrated bees.

Now, how can you manage bees for profit? Successful beekeepers do this: They locate the time when the main honey flow comes. This is usually when sweet clover is beginning to bloom. From this they count back 60 to 70 days and begin feeding to stimulate the colony and get the queen to laying. If this is carried thru the third cycle, the queen eggs will have hatched and matured just as the clover flow opens. The feed he gives is a pollen substitute that supplies most if not all the pollen to rear the bees. This substitute is made from soybean flour (three parts),

Worry: The interest paid by those who borrow trouble.

brewers yeast (one part) and powdered skim milk (one part), which is made into a soft dough with sugar water in the ratio of 3 pints sugar to 2 pints of water. Mix the soybean flour, yeast and milk together, and stir into the sugar water. Mix this into a very soft dough and let it set over until morning. The dry mix will absorb all the water overnight. Add more sugar water, and make a dough that will be soft and not runny.

Select A Warm Day

Sixty days will set you back into cold weather. But select a warm day, open the hive, expose

the bees and smoke them down off the frames. Put down a square of paper and put a big handful of your mixture on it. Turn the inner cover of the hive upside down over it, and put on the lid. Repeat this about every 10 days until flowers come. Feeding this way will bring the bees to sweet clover time.

Caution: Never open a hive of bees without a veil over your face, a pair of bee gloves and smoke material lighted and handy. If you are stung badly and are allergic to stings, see your doctor.

New Method To War on Cattle Grubs

Cattlemen are alerted to a new weapon to help control those ornery cattle grubs. The weapon is a systemic pesticide called Rulene which now can be poured onto the backs of cattle. This pour-on chemical recently was approved for release by the Federal government.

Some ranchers already are using a systemic spray, as contrasted with a pour-on method, to control cattle grubs. Some Arizona cattlemen, however, have wanted something they could pour onto the backs of cattle when the cattle are squeezed into a chute and being branded, or to use in a small working area where they did not have spray equipment available.

"From preliminary trials, it appears the pour-on method is not quite as effective as spraying. It controls grubs, but does not seem to be as effective against internal parasites," Al Lane, Arizona livestock specialist, explained.

"However, the pour-on method does have an advantage to ranchers in a small working area where spray equipment is not available," he added. *—Arizona Farm News*

"You know," said John Perkins, "it used to be said anybody could farm — that about all that was required was a strong back and a weak mind, but nowadays, to be a successful farmer a feller must have a good head and a wide education in order to understand the advice ladled out to him from all sides by city men and to select for use that which will do him the least damage." *—Oral Hygiene*

How Terracing Pays

Costs of terracing a farm depend on degree of slope and method of terrace construction. Such costs are usually repaid by added yields in 1 to 3 years . .

Condensed from Nebraska Farmer

Harold Gilman, University of Nebraska

DOES terracing really pay? One answer, although not covering the entire situation, is that a soil and water conservation practice will not pay for itself in just one year, but must be considered an investment for the future.

Another answer is that terracing is only one practice in a complete conservation plan, and probably one of the most expensive practices to establish.

Every landowner wants more profit on his investment. Every tenant wants more profit for his time, labor and investment in machinery. When either party asks the question, "does terracing really pay?", the reasons for soil and water conservation and methods of conserving of these two natural resources must be understood before the question can be analyzed.

More emphasis is now being placed on soil and water conservation as a means to ensure more profit for both land and tenant and to leave to posterity, the land that we now have temporarily under our control.

A farmer's crop depends upon the soil on his farm, and his livestock depend upon the crops he grows. Loss of soil means loss of fertility, which in turn is reflected in lower yields and reduced profits.

Soil and water go together like ice cream and cake. One can have good soil and no water, very little water, or too much water and produce poor crops. One can have the right amount of water and poor, eroded soil and also raise poor crops. Both good soil and the proper amount of water are necessary for profitable crop production.

Soil is found practically everywhere in varying degrees of thickness and fertility. If we are to cultivate and improve it, then mechanical and cultural methods must be used to keep it where it now lies, protect it, improve its fertility and tilth. These things

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cannot be done by exposing it to the uncontrolled forces of wind and water.

Force of Raindrops

Water in the form of rain falls from the skies to the bare soil with a tremendous force. Each raindrop is like a miniature pick and shovel, jarring particles of soil loose and carrying them down the slopes to the flat areas and into the creeks, rivers and on to the oceans.

It has been calculated that doubling the speed of water increases the silt-carrying capacity of the water by 64 times. The beating of raindrops on the surface of bare soil breaks down the structure of the soil only a few millimeters in thickness to form a semi-permeable surface. This condition then reduces the absorption of water into the soil and more water runs off the field. The saturated, silt-laden runoff water causes a scouring action passing over other soil particles, causing more erosion on the journey down the slope. When these conditions are allowed to continue the valuable topsoil is washed away and less water is absorbed into the ground.

To Control Erosion

In the control of soil erosion, three things must be done.

1. The force of the raindrop must be reduced before it hits the bare soil.

2. Water must be slowed so that it moves slowly horizontally.

3. The physical condition of soil must be in such a condition that it absorbs water readily.

Several steps can be taken to break the force of water falling from the skies. The best method is to have a good cover of grass and mulch of decayed plant material covering the soil surface. A second method is to maintain a living close-grown crop, and the third is to keep a covering of crop residues on the surface of the soil at all times. This erosion control practice involves keeping small grain stubble and corn stalks on or near the surface by use of sub surface tillage.

The second way of controlling water erosion is reducing the speed of water running off a field. Terraces are devices which shorten the slope and thereby reduce the velocity of the movement of water. When terraces are spaced at the recommended distance apart, soil loss is held to a

"Many of the world's agricultural problems may be traced to political and sociological ills, failure to apply methods already well known, and lack of education. It is fully as important to educate for social changes as to instruct in the latest technological methods."

—S.R.I. Journal

minimum and a greater absorption of water is obtained.

In experiments in Iowa, terracing held soil loss to less than 5 tons per acre on a Napier silt loam on slopes up to 8%. Soil loss with a cash-grain farming system on eroded Ida silt loam on a 12 to 20% slope was 319.5 tons per acre with no mechanical practices. Soil loss was reduced to only 48 tons per acres under the same cropping system when terraces and contour farming were added.

In a study at Bethany, Mo., an unterraced field lost 2 inches of topsoil in 11 years, as compared with no visible soil loss on an adjoining terraced field. Both fields had been cropped with an identical 4-year rotation.

Cost of Terracing

The cost of terracing on a farm varies with the slope and method of construction. The slope determines the number of terraces and the number of linear feet of terraces needed. The steeper the slope, the more linear feet of terrace is required and therefore the greater the total cost of terracing.

In USDA technical bulletin No. 1162 entitled, "Economic Evaluation of Use of Soil Conservation and Improvement Practices in Western Iowa," produced in cooperation with the Iowa Agricultural Experiment Station, the following results from terracing studies were obtained:

Terraces constructed with a moldboard plow range from a cost of $2.04 an acre on slopes up to 5% to $5.39 on the steep slopes of 12-20%, when operator's labor is included as a cost.

Custom hiring a motor patrol at 3 cents per linear foot of terrace costs $7.69 on the lowest slopes and $20.30 on 12 to 20% slopes. The corresponding costs of terraces constructed by a whirlwind terracer are $3.15 and $8.32.

When done by a bulldozer, the costs were $5.33 and $14.07. The costs for a moldboard plow, whirlwind terracer, or bulldozer are considerably lower when the operator's labor is not included as a cost.

God seems to grant liberty not to those who want it, but to those who are willing to fight for it.

The cost is greatest when terraces are built on a custom basis. The cheapest method is with the moldboard plow and a two bottom tractor.

The vast majority of terraces now being built are constructed by custom operators; few are built using the farmer's own tractor and plow. In Iowa in a

severely eroded soil called Ida silt loam on steep slopes, the combined practice of terracing and contouring, with terracing done with a moldboard plow, would be paid for by the additional yield in 2 to 3 years. When terraces are constructed by custom hiring 5 to 6 years are needed to pay for the practice. When fertilizer is added, the practices are paid for 1 to 2 years sooner.

Manure Has A Real Dollar Value

Generally a ton of manure provides plant food equal to approximately 100 pounds of a 10-5-10 fertilizer. Of this about half is available to the plant in the year of application. The table below is a guide to manure plant food values.

	ONE TON	POUNDS OF NITROGEN (N.)	POUNDS OF PHOSPHORUS P-2, O-5	POUNDS OF POTASH K-2, O
TOTAL PLANT FOOD IN ONE TON OF DIFFERENT ANIMAL MANURES	Cow Manure	11 lbs.	3 lbs.	10 lbs.
	Steer	15 lbs.	6 lbs.	8 lbs.
	Horse	13 lbs.	5 lbs.	12 lbs.
	Pig	10 lbs.	7 lbs.	9 lbs.
	Sheep	16 lbs.	7 lbs.	18 lbs.
	Chicken	21 lbs.	16 lbs.	10 lbs.

—The Farm Spokesman

Liquid Fertilizers

Fertilizers in liquid form are challenging the market for the dry type. Equipment for applying liquid fertilizer can be less expensive, rate of application covers a wider range, transport and handling is more easily mechanized, according to W. C. Krueger of Rutgers University.

Developments in the processing of fertilizer in liquid form now make nitrogen, potash and phosphorous available and practical. Liquid fertilizer can be transported by tank truck and delivered to tank storage on the farm for quick and easy loading of the fertilizer distributor.

—Rutgers University

Pelleting Can Cut Feed Costs 14%

Purdue research shows advantages of pelleting the right ingredients in the right proportions . . .

Condensed from Successful Farming

Dr. T. W. Perry

AS A cattle feeder, are you interested in a different approach to cattle feeding that cuts feed costs 14%, gives rapid gains and a high-quality carcass?

The key to such a feeding program is pelleting—not just any pellet, but one with the correct proportion of roughage to concentrate.

Farmers and feeders have been bombarded with information on pelleting the past 2 to 3 years. Such articles have discussed all sizes of compressed materials—pellets, cubes, wafers—and have dealt with almost all types of livestock.

Beef cattle researchers have come up with these conclusions: (1) the pelleting of predominantly concentrate rations results in slower gains, and (2) the pelleting of roughages seems to improve their nutritional quality but also increases the cost of the roughages. Beef feeders aren't too interested in "buying" either of these conditions in spite of many automation advantages of pelleted rations.

Not enough research has been concerned with pelleted rations containing various proportions of roughage to concentrate in order to produce a pellet which would give fattening gains, rapid gains, and more economical gains. In other words, how about pelleting a ration that was intermediate between an all-roughage and an all-concentrate ration?

Recent reports by Purdue University and the University of California have shown that if you will pellet a predominantly roughage ration of 60 to 70% roughage and 40 to 30% concentrate, fattening cattle will give comparable or increased rates of gain. Purdue data shows that you can put on the fattening gains at a 14% feed-cost saving. California lists no feed-cost data in its report but shows a 5% savings in favor of pelleted rations.

Reprinted by permission from Successful Farming, Des Moines 3, Iowa

In the Purdue comparisons, a fattening ration containing 71% corn, 9% Supplement A, and 20% long hay was compared with the same ration which had been ground and pelleted into a ¼-inch pellet. The pelleting of this predominantly concentrate ration gave the usual story of poorer gains from pelleting concentrates. When a ration containing 40% hay was pelleted, better results were obtained than with the 20% hay pellet.

The best results were obtained from pelleting a ration containing 60% hay and 40% corn—no supplement. Cattle fed the 60% hay pellet gained almost as rapidly as those fed the high concentrate ration in the meal and long-hay form, but it cost 14% less to put on gains with the 60% hay pellet. Both groups sold for the same price and the 60% hay pellet cattle graded slightly higher in carcass.

The California researchers compared a ration of 70% alfalfa and 30% concentrates (barley and dried beet pulp) in meal form and in pelleted form for fattening beef steers. A 7% increase in gain and a 5% decrease in feed required per 100 pounds gain was in favor of the pelleted ration. When a 40% hay and 60% concentrate ration was compared in the pelleted and unpelleted form, cattle fed the pellets did not eat as much feed and actually gained 13% less rapidly.

The data is quite consistent—cattle do not seem to do as well when you pellet a predominantly concentrate ration. However, pelleting can pay real dividends in a cattle-fattening ration if roughage comprises from 60 to 70% of the ration.

Research workers have realized the pellet had a real future in the feeding business because of such advantages as: (1) less wastage of leaves, (2) reduced storage requirements, (3) less dustiness of feeds, (4) more adaptable to range feeding conditions, (5) well adapted to automation and mechanical feeding, (6) prevents sorting and selective eating, (7) and insures that every mouthful eaten consisted of a balanced ration.

When the various results reported by 2 dozen or more experiment stations are lumped together on the basis of level of roughage contained in the pellet, they give a marked advantage for pelleting high-roughage rations but give no advantage for pelleting a high-concentrate ration.

Cattle can't get fat on the 100% roughage ration in spite of the advantage from pelleting, and the high concentrate rations are not as good pelleted as in the meal form. For this reason, pelleting seems not so favorable for beef cattle until a mixture of 60-70% roughage and 40-30% concentrate is pelleted.

Get Those Cows In Calf!

Good herd management is essential if cows are to calve regularly. This British cowman outlines a program which will help.

Condensed from
Farmer & Stock-Breeder
T. Collier

INFERTILITY is one of our major problems. Certainly it is a costly one to the farmer, and a frustrating nuisance to the cowman.

It is so easy to blame silage, pastures, lack of sunshine, high yields, lack of exercise, and a hundred and one other things, including the unfortunate cowman, when many of the troubles are of our own making, and easily cured.

First, look at your buildings. Bull pens should be sited so that the bull can see, hear and think about his harem. If your cows are in sheds, then have your bull pen as part of the same building, and have his exercise yard in your cow yard, so that the cows can "talk" to the bull whenever they are out.

If you are a yard and parlor man, then have the bull pen as an integral part of the same building. And, while you are about it, have some decent lights round and about the bull's quarters. Cows don't always choose the daylight hours to come bulling, and it is a foolish man who plays about with bulls and cows in the dark.

Design your bull pen so that one man, with SAFETY, can introduce a cow to the bull. It is important that your cow-shed or parlor should have windows so that the cows can be under observation by the cowman all the time they are in the yard. Signs that a cow is bulling can be fleeting and so easily missed.

Having got your buildings in order, tackle the management of your mating season. First, get your bull steamed up. Don't give him that moldy hay which the cows won't eat. Give him the best hay, the best silage, and concentrates equal, at least, to two gallons of milk, for six weeks to two months before your mating

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Farmer & Stock-Breeder, Dorset House, Stamford Street, London, S. E. 1

season begins, and during your mating season.

Weight On Bull

Don't get him so fat that he can't stand on his hind legs, but don't be frightened of putting a bit of weight on him—he'll work it off.

Next, your cows. You must feed for mating as well as for milk. Check that your cow rations contain all the necessary minerals and vitamins. Your vet ought to be able to tell you the best minerals to use. Do be sure that you are not under-feeding your cows. At least have your silage analyzed, to be sure you know how much water you are feeding!

The herd manager must give the cowman a date on which serving is to begin and how long a period after calving is to elapse before a cow is served. As a general rule, about eight weeks after calving is a good time to serve a cow. Any shorter period tends to depress present and succeeding lactations, and the longer they are left before service the more difficult it seems to be to get the cows in-calf.

Shedded cows should have individual boards, showing name, calving date, date after which the cow can be served, and dates of services. Yarded cows should have a similar board in the parlor, with space for all the cows' particulars.

Lastly, we come to the most important member of the team —the cowman. He is the man on the spot, in close touch, day in, day out, with the cows, and to get them in-calf at the right time he must know them as individuals.

To this end, I do not think that any one man should be in charge of more than fifty milking cows. There are many bigger herds, but the signs that a cow is ready for the bull are many and varied, and I don't think that one man can really know the fads and fancies of more. If the cowman is going to wait until he sees a cow madly riding other cows round the yard before he decides it is bulling, then he is going to wait an awful long time.

Don't over-feed beef cows nursing baby calves.

Some cows will stand when ridden by other cows. Some won't. Some cows will bawl at and for the bull. Some cows' milk yield will fall when they are bulling, and some will even rise. Some cows will literally stream. Most cows will show a cloudy vaginal discharge some time before the onset of heat, and a clearer discharge nearer the vital time.

I like to record, on the cows' own boards, all the dates they

are bulling, except the first one after calving, so that when the time comes for them to be served then I have a fair idea when to expect them to be ready for the bull.

Now for the actual service. The system of bringing the bull to the cow has its disadvantages, and I now take the cow to the bull. The service pen in our bull pens is designed just wide enough for a small cow to turn round and rough-sided enough to take the skin off the bull's legs when he mounts.

So now I take the cows into the bull pen proper, and leave them there, for a couple of hours sometimes, while I get on with other jobs. It seems that bulls and cows also like some time for courtship and I have had cases of cows which wouldn't stand for the bull when first introduced, standing perfectly for a service when left with the bull for a while. Conception rates seem better, too. This system does need using carefully when the bulls are very busy, or they may get overworked, but on the whole I find it better.

Having got your cow served and booked down the date, a close watch must be kept from two and a half weeks onwards for further signs of heat. Cows' heat periods vary, and even individual cows will show varying periods, so don't be too complacent if three weeks have gone by without the cow coming into season again.

Ask your vet at what period after service he likes to do pregnancy tests. Some will do a test at six weeks, but most vets seem to like seven weeks for heifers, and eight weeks for cows.

Do have your cows tested. Probably the cost of testing the whole herd can be saved by finding one animal with some easily cured trouble, and so give you an in-calf cow, instead of a barrener. Conversely, it is not the slightest bit of good wearing out your bulls on an animal which just can't be got in-calf. The vet can save you dollars.

So there you have the team—the landlord with his properly designed, properly sited buildings—the manager with his clear and workable p o l i c y—the cowman with his intimate knowledge of his animals—the vet with his professional knowledge and skill. If they will all work together then it should be reasonably easy to get those cows in-calf.

Reduce Rust — Farm machines can rust out quicker when neglected than they can wear out under normal usage with good care. Agricultural engineers urge farmers to use a rust preventive on frictioning parts when machines are not in use.

Music For Plants ?

No one knows exactly why but it works . . .

Condensed from Western Farm Life

NOW we've heard everything. Research in Asia and Europe shows that plants grow faster when certain musical rhythms are played nearby, while other rhythms decrease growth.

Now we don't doubt the validity of the findings of this research—it may very well be that certain sounds stimulate growth, but what we're wondering is just how it will be applied.

Will the fields of tomorrows' farms be spotted with recording devices which blare forth the gentle strains of Schubert and Brahms? Will ears of Iowa corn be trained to appreciate the lively notes of "Old Mac Donald" with real farm animals supplying the sound effects? Will the graceful heads of Kansas wheat be soothed by the measures of "An American in Paris," or will it be the aboriginal stomp of Elvis? Only time will tell!

Don't be surprised if advertisers begin to promote farm products with such phrases as "growth enriched through music," "musically fortified cereals" or "eat better with music." Who knows, perhaps music will replace fertilizer!

Oh well, we are content with plant growth that provides the greatest food abundance the world has ever known—music or not.

Perhaps there is music after all —the croaking of a frog; the first squeal of a baby pig; the song of a bird; the muffled din of a tractor in yonder field; the whistle of a train speeding across the lonely prairie; beep-beep of the family car horn; gaiety of children laughing; a cussword when a finger gets bent; sound of rain on the roof; murmur of a child's prayer—yes, these and many more sounds make up a symphony of work and industry that is music to our ears in a concert hall of freedom—America!

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Keep Eggs Clean — Two or 3 inches of clean. dry shavings in nests in the laying house help prevent breakage and keep eggs clean, says F. H. Leuschner, Penn State extension poultry specialist. He also suggests frequent gathering of eggs, and wiring the droppings boards.

Boost Farm Size To Make More Farm Profits

Farm records show advantages of 300-acre to 400-acre farms . . .
Condensed from Livestock Outlook News
D. F. Wilken

INCREASING the acreage of farms reduces costs per acre, and increases the operator's earnings. But usually only small savings in costs can be made by increasing beyond about 320 tillable acres, and only small gains in income can be achieved by increasing beyond 400 acres.

These facts are brought out by studies of records from 1,369 farms in the northern two-thirds of Illinois for the years 1957 to 1959. The record keepers cooperated with the Department of Agricultural Economics through the Farm Bureau Farm Management Service.

The farms were divided into five size groups, averaging about 160, 240, 320, 400, and 640 tillable acres.

Farms where less than half of the value of crop production was fed to livestock were classified as grain farms, while those with more than half of the crops fed were livestock farms.

If over half of the crops that were fed went to hogs, the farm was called a hog farm. If over half was fed to beef cattle, it was a beef farm.

There were 581 grain farms, 488 hog farms, and 300 beef farms.

Total non-feed costs per tillable acre, including all cash costs and allowances for depreciation, unpaid labor, and interest on capital, are shown in chart 1.

Costs Cut 20 Percent

On the hog and beef farms, the costs were $24 per tillable acre less for the 640-acre group than for the 160-acre farms. On the grain farms the difference was about $17 an acre. In each case the reduction in costs per acre was 20 percent or more.

Most of the savings can be made without going up to 640 acres. In fact nearly half of the savings occurred as the farm size moved up from 160 acres to 240 acres. Nearly three-fourths of the total saving was gained at 340

Condensed from Livestock Outlook News, published by University of Illinois, College of Agriculture, Urbana, Illinois

acres, and 90 percent at 400 acres.

These differences indicate a great incentive for farms smaller than 240 acres to add acres to save costs. But there is little incentive for the average farmer to increase the size of his farm beyond 400 acres simply to cut costs. The small cost advantage that the largest farms have over farms between 240 and 400 acres can often be offset by other adjustments in the business on the smaller farms.

Earnings High at 400 Acres

Operator's labor and management earnings for each type and size group are shown in the chart 2.

The biggest differences in income were the smallest size group, averaging 160 acres. Here earnings were highest on hog farms, medium on beef farms, and lowest on grain farms.

Adding acres brought the most gains on grain farms, and the least on hog farms. Earnings on grain farms climbed very rapidly from 160 to 240 acres, less rapidly to 400 acres, and slowly thereafter. On beef farms earnings increased steadily as more acres were added.

For hog farms earnings increased sharply from 160 acres to 240, dipped at 320, and then reached their highest point at 400 acres.

The reasons for the dip in earnings on hog farms at 320 acres and the decline for those with the largest acreages are not clear. Perhaps the 320-acre farms were too big for one man, but not large enough for two. Management may have been spread too thin on the largest hog farms.

Grain and beef farms require almost twice as much acreage for good earnings as do hog farms. They must have nearly 320 acres to equal the earning level of 160-acre hog farms, and around 400 acres to equal 240-acre hog farms.

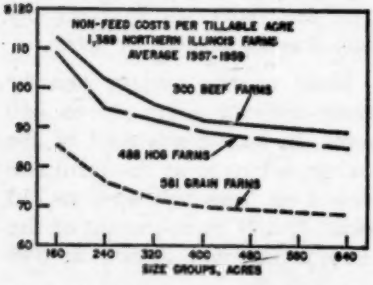

Chart 1: Costs per tillable acre decrease rapidly as acreage increases from 160 to 240, and slowly on up to 400. Increasing acreage above 400 cuts costs very little.

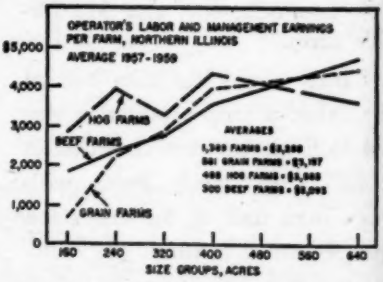

Chart 2: The earnings of a farm operator respond quite differently to added acreage, depending on whether the farm is a hog farm, beef farm, or grain farm.

How Much Is Manure Worth?

Every load hauled out to the fields is like money in the bank . . .

Condensed from Wallaces Farmer

IF YOU'RE a livestock farmer, chances are the price you put on your manure "crop" fluctuates widely.

With an open winter, mild temperatures, and no squeeze on labor, every load hauled out to the fields is like money in the bank.

But with opposite weather conditions, farmers swear manure is nothing but a nuisance. They'll give it away just for the hauling.

The truth of the matter is you can't say exactly what manure is worth. Its value depends upon the kind of animal that produces it, the stockpiles, and even the way it is handled.

But make no bones about it —manure is perishable. If it lays around exposed to sun, rain, and freezing and thawing temperatures, it may not be worth the effort it takes to haul it out.

By the same token, if handled properly, manure can make quite a dent in your fertilizer bill.

Most authorities say one ton of barnyard manure contains about 10 pounds of nitrogen, 5 pounds of phosphate, and 10 pounds of potash.

What's this worth to you? Roughly $2.50 at prevailing fertilizer prices.

Milo and Dale Stall, father-son farmers in Polk county, Iowa, go a little higher. "It's got some organic matter too — we figure manure worth $4-5 per load."

They manured 125 acres of cropland last year — "mostly covered it wheel track to wheel track," says Dale. "We consider it important enough to haul every day, weather permitting."

Actually, in terms of nutrient content, poultry manure ranks first in value. Its analysis runs 20-16-8 (N-P-K pounds per ton). Sheep manure, 19-7-20, is second. Cattle and hogs are about equal.

Just how usable are these nutrients? Phosphorus and potassium are just as available as that in commercial fertilizer. This is also true of the nitrogen in the liquid portion of manure. But nitrogen tied up in the soils is gradually released over more than one year's time.

Reprinted by permission from Wallaces Farmer, 1912 Grand Avenue, Des Moines 5, Iowa

So, as with commercial fertilizer, you can get a response even 2 and 3 years after manure is applied.

In fact, if handled without loss, manure would return to the soil roughly 75 percent of the N, 80 percent of the P, and 90 percent of the K contained in the crop plants originally fed to your livestock.

Point is—you've probably got a manure "crop" to handle. So you might as well see that it's harvested properly.

This means holding nutrient losses to a minimum. The two most common suggestions are:

(1) If weather, field conditions, and livestock management permit, spread manure on fields daily.

(2) If manure is stored, keep it thoroly compacted, moist but not wet, protected from the weather, and undisturbed during storage.

"The greatest savings of manure nutrients occur when the manure is built up in a pack," declares Iowa State Agronomist J. A. Stritzel.

He adds, "This means the use of enough bedding to absorb all the liquid portion of the manure."

If you can't use the pack system, daily spreading is your next best way of conserving nutrients.

Nitrogen Conversion Table

Chart below shows number of pounds of fertilizer required to supply actual nitrogen in pounds (first column) as listed in fertilizer recommendations.

Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	N-Sol-32	Urea
40	49	120	124	89
50	61	150	155	111
60	73	180	186	133
70	85	210	217	155
80	98	240	248	178
90	110	270	279	200
100	122	300	310	222
120	146	360	372	266
140	171	420	434	311

—Chemical Farming

How To Buy Fertilizer

Here's how to buy on the basis of plant food content and save money . . .

Condensed from Kentucky Farmer

Harold F. Miller, University of Kentucky

BUYING fertilizer by the bag or ton can mean you miss a bet on getting the plant food you need for your crops at the cheapest price.

Farmers could save thousands of dollars annually if they purchased on the basis of the plant food content in each bag, rather than the cost per bag or ton.

Here's how it works:

Let's say that you have taken your soil in for testing to the local County Agent. You have 20 acres of land you want brought up to the proper fertility level.

Soil Test Recommendations

The County Agent has your soil tested and he tells you that for each of those 20 acres you need 15 pounds of nitrogen, 60 pounds of phosphate (P2-O5), and 60 pounds of potash (K2-O). The numbers and letters, of course, are the chemical symbols of the plant foods. These appear on fertilizer bags, too.

The County Agent will be glad to "interpret" these soil test results and recommend the fertilizer you ought to go out and buy. But many farmers today want to know how to figure what they need themselves, so they can be sure they pay only as much as they really have to for the fertilizer they need.

Figure It Out Yourself

From the soil test above, you can easily figure out your own needs. Sharpen up a pencil and then:

1. Take the soil test recommendation figures . . . 15—60—60, and reduce them to their lowest ratio. A ratio simply means the amount of one plant food in proportion to the others. To find the lowest ratio you divide each of the numbers by the largest number that will divide evenly into each one.

In this example the largest number that would divide evenly into each one would be 15. That

Reprinted by permission from Kentucky Farmer, Box 210, Middletown, Kentucky

would then reduce your soil test recommendation to a ratio of 1—4—4.

This means your soil needs four times as much phosphate and potash as it does nitrogen. Or, for every pound of nitrogen you put on, you should also put on four times as much phosphate and potash.

2. Now you are ready to talk to the fertilizer salesman. Look on the 100-pound bag of mixed fertilizer. On every bag you will see figures that will tell you exactly how many pounds of plant food are in each 100 pounds. There are three figures. The first one shows the pounds of nitrogen (N), the second show the pounds of phosphate (P2-O5), and the third one shows pounds of potash (K2-O).

You Have A Choice

3. You want the bag of mixed fertilizer whose figures are in the same ratio as what you need. You have already determined this to be 1—4—4.

So, you have a choice between any of the fertilizers which have a ratio of 1—4—4, such as:

3—12—12
4—16—16
5—20—20
6—24—24

You see? Each of these fertilizers also have the 1—4—4 ratio. Check it yourself. If you take the 5—20—20 and reduce it to its lowest ratio, you would divide by the largest number that would go evenly into all three numbers. For 5—20—20, this number would be 5. Dividing 5 into each number you would have 1—4—4. So you know this fertilizer will fill the bill for you.

Or will it? How about the other three we mentioned?

4. Now's the time you get into what you have really been doing all this figuring for. Since you have a choice of several grades of mixed fertilizer, all of which will do exactly the same job on your 20 acres, you naturally are looking for the best deal in price. You don't want to pay any more for fertilizer than you have to.

Soil structure improves each year a field is left in bromegrass, say agronomists. Brome improves the structure twice as fast as does alfalfa.

High Analysis Fertilizers

The grades of fertilizer with the higher numbers are high analysis fertilizer. This means, for example, that the 6—24—24 is the highest analysis of all four of the grades we have mentioned.

5. Next, you check with the fertilizer salesman on how much he is getting for each of the grades. Let's say that he tells you that the 3—12—12 is selling for

$46.00 a ton, and the 5—20—20 sells for $68.25 a ton. The higher analysis fertilizers cost more than the lower analysis ones per ton.

However, it is also true that because of the higher analysis you usually don't need as much total fertilizer in the higher grades as you do in the low. Note that while all the fertilizers in our example had the same ratio, you still have to vary the rate of application of each in order to make them all do the same job.

You can spread lime as long as you can get out on frozen fields, even if it's on top of

This means you don't have to put on as much high analysis fertilizer as low analysis in a given situation.

In our example, you are buying fertilizer for 20 acres. You can get the exact same plant food to your soil if you put on these 20 acres either:

5 tons of 3—12—12, or
3 tons of 5—20—20.

Assuming the salesman gives you the costs per ton we gave above this means you would pay:

5 tons 3—12—12 at $46.00 per ton	$230.00
3 tons 5—20—20 at $68.25 per ton	$204.75
This gives a savings of	$ 25.25

You got this savings by buying the mixed fertilizer in a higher analysis grade . . . or, by purchasing plant food, not buying by the price tag on the bag alone.

First Glance Wrong

At first glance—just looking at the price per bag—it would seem the lower analysis fertilizer at $46.00 a ton was your buy. This is the mistake so often made in buying fertilizer.

By putting on less fertilizer of a higher analysis, you save yourself $25.25 on that 20 acres.

Your fertilizer salesman or any County Agent will be glad to help you figure out just what is your best buy. The main thing is for you to know how to figure it yourself and to know that it's buying plant food, not bags, that counts in saving dollars on fertilizer.

Need Soil Test

Needless to say, you must always first have a good soil test to know exactly the plant food required on your crops. Take your soil test the right way. Results of a soil test will be no more accurate than the sample you submit to the County Agent.

Your County Agent generally has plenty of pamphlets on how to take a good soil test.

In our example above we were talking about buying mixed fertilizers. Any fertilizer with two or more plant foods in it is referred to as a "mixed fertilizer."

There are "straight fertilizers," too. They contain only one plant food, such as nitrogen (N) by itself. or phosphate (P2-O5) by itself, etc.

In some areas you can buy plant food in either dry or liquid form. In liquid fertilizers, the guaranteed analysis is on a percentage basis just like the dry material. You can figure your best buy with liquid, therefore, just like you can with the dry, as we did in our example.

Remember that limestone is important, too, in fertilizing your crop land. The proper use of limestone is perhaps the most neglected phase of the fertilization program.

Feed Conversion, Key To Profits with Layers

Feed cost is fifty to sixty per cent of the total cost of producing a dozen eggs, according to a Wisconsin poultry specialist. Barry Hayes says feed represents the segment wherein saving can be made.

The pounds of feed needed to produce a pound of broiler is of utmost concern to the broiler grower, according to Hayes. It is the first computation the broiler man makes when he sells a house of birds.

Hayes figures the producer of eggs must make the same close scrutiny of his operation. He runs a flock for 14 to 15 months rather than the ten week period for the broiler grower. He can, however, check on himself for a period of a week, a month or any other to be determined period.

Keep a record of feed consumption and a record of egg production. Convert the egg total to dozens. With the known egg production in dozens and the feed consumption in pounds, divide the feed by the dozens to obtain the conversion or pounds of feed required per dozen eggs. This number should be less than five—possibly 4.5.

If the number is above five, check for a feed waste. This may come from overfilling the hopper, placing hoppers too low, faulty design, oversize birds, or low production. Feed conversion should be determined every month with a laying flock. It is more important than but usually associated with rate of production. A poultryman can take more pride in a low conversion than a high rate of production.

—University of Wisconsin

You'll Profit From Beef Breeding Research

Promising new research is prompted by need to cut production costs . . . and fact that broilers and swine have run circles around beef in breeding improvements of economic importance . . .

Condensed from Nation's Agriculture

Charles Hughes

SOMETHING has happened to beef breeding — something like an inner explosion. It has kindled the fires of investigation, sending researchers at 38 state experiment stations and the USDA along a maze of investigational avenues.

The prime causes? Several. Included are the need for cutting production costs, the changes in retailer-consumer demand, and a reluctant realization that broiler-fryers and to some extent, swine, have cut circles around beef cattle when it comes to breeding improvements of economic importance.

Untold impetus has been lent by scientific pin-pointing of the fact that many desirable characteristics of a beef animal are highly heritable—that in many cases more can be done through breeding than by any other way.

The USDA researchers, in cooperation with state agricultural experiment stations, began to convert into figures the degree to which various economic traits could be influenced through inheritance and how much through environment.

On production values, they established these averages for heritability: Birth weight, 41 per cent; weaning weight, 30 per cent; feedlot gain after weaning, 45 per cent; and feed conversion efficiency, 39 per cent.

Consider birth weight of a calf as an example, approximately 41 per cent of the influence comes from inheritance and the remainder from environmental conditions like how well the cow was fed during pregnancy and weather conditions.

Although most of the desirable production characteristics have moderate to high heritability, the few available estimates for reproductive traits are uniformly low. Fertility, for example, has a heritability estimate of only 8 per cent. Greater opportunity seems to be afforded by judicious cross-

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breeding than straight breeding in raising the reproductive rate.

So what? Haven't good stockmen for many years been able to tell a lot of these things by just looking?

To some extent, yes, but quite often the stockmen were losing on some traits while gaining with others. They failed to realize this until too late and, even then, they didn't know what to do about it.

What these stockmen didn't know was that some important traits go along well with others (positive correlations) and a few don't (negative correlations). Some are independent of one another. These avenues of breeding become highly involved but they're nonetheless essential to practical progress.

Here are a few examples of how these correlations work: Rate of gain and feed efficiency are positively correlated—when you select and breed for one you're pretty sure of bringing the other along with it.

An example of the other extreme is the negative correlation between maternal ability of the dam and the ability of the calf later to make gains in the feedlot.

The explanation is that a calf suckling a good-milking dam makes such big pre-weaning gains that there's relatively less chance for the genetic potential to assert itself after weaning. Since the calf from the good-milking cow may have as great a weight for age as the faster-gaining calf, this negative correlation is not considered serious; in fact, few if any of the negative correlations are serious. This is fortunate.

To apply these correlations, a stockman wishing to breed calves which can make rapid, efficient gains and have good conformation as well, should select sires and dams for all three of these traits simultaneously. Each should be weighed according to its relationship with the other and the net worth of the calf.

Sympathy is about the only gift left for people who have everything.

Since we know much more definitely the degree of influence that inheritance can have on various factors, we may assume with fair certainty that the way the offspring do is a pretty good indication of the value of the sire.

To say that performance and progeny testing are booming is putting it mildly. Many buyers now refuse to purchase breeding stock or feeders unless the seller has an impressive set of performance or progeny test records. Before long this will become general practice.

To get a few specific examples, let's look across the nation:

The way that bulls vary in ability to sire calves that can

make a profit through fast gains has been shown in dramatic fashion in an Oklahoma Experiment Station test. The calves sired by one bull were worth an average of $10.68 more as weaners than others from a different bull on comparable dams. After being fed to slaughter weight, the calves from the better bull returned $10.07 more per head.

In Texas performance tests, covering various breeds, some bull calves gained over three pounds per day while others gained only one. It was also found that the higher the gain of parents in the feedlot, the higher the gain of offspring on pasture.

Members of the Virginia Beef Cattle Improvement Association found surprises in every herd tested. Individual animals have varied from less than ¾ pound to over 3 pounds of gain per day. Fast-gaining cattle make beef at lower feed cost. Steers showed a saving of 22 pounds of TDN (total digestible nutrients) for every 1/10 pound increase in rate of daily gain; bulls saved 12 pounds of TDN for the same increase.

Variations from common to fancy grade have been noted. The Virginia test revealed that some bulls produced calves which averaged as much as 90 pounds more at weaning than calves by other bulls in the herd.

On conformation, the trend for several years has been toward more size and ranginess, while still trying to retain thickness of body. You can recall the 30's and 40's when the swing was toward shortness of leg and body, to a point where there was marked loss of body mass.

As one researcher at the USDA Field Testing Station, Miles City, Montana, put it:

"Many producers select for 'short-coupled' cattle. Since a high percentage of valuable cuts are down the back from the shoulders to the hocks, this is a questionable practice. We may have been placing undue emphasis on development of lower round and other relatively less important areas, without giving enough attention to portions furnishing the best cuts."

Each American uses, directly or indirectly, about 26 million gallons of water during his or her lifetime.

In the end, though, superior muscling is what counts—and not the length of leg or body. Indications of superior muscling are thickness of shoulder, a back that looks like a Quonset roof, a round that carries down thick and full and widest halfway between rump and hock when viewed from the rear. Length is desired from hook to hock and from pin to stifle. And, contrary to a lot

of thinking, a relatively heavy bone is desired—because of a newly-appreciated relationship of bone to muscling.

So far, we have been considering only production or growth factors. Researchers have observed that, while fast and efficient gaining animals do not necessarily cut out in a fashion that would please the packer, retailer, and consumer, there is no antagonism. In other words, these two sets of traits can go together, even though not always.

Heritability estimates for carcass traits are as follows:

Dressing percentage, 71; carcass grade, 34; rib-eye area, 69; and tenderness, 71. It is readily apparent that, for the most part, the chances for improving the carcass through breeding are even greater than for growth traits like birth weight, weaning weight, feedlot gains, pasture gain and efficiency of feedlot gain.

Since researchers, by and large, have been more production-minded, than processing or market-minded, the research emphasis so far has been heavily on the side of growth or production. However, here are some indications:

The USDA has shown that each increase of 3 square inches in the rib-eye area (rib-eye comparisons are made by quartering a carcass between the 12th and 13th ribs) increases the carcass yield of retail cuts by about 2 per cent among carcasses of the same weight and fatness. The USDA has concluded that the negative effect of fatness is approximately twice as great as the positive effect of muscling.

The importance of marbling in beef has been subject to challenge and debate. Research results at several experiment stations and USDA have indicated that marbling does not induce tenderness to any great extent but that well-marbled beef is likely to be more juicy and more palatable than poorly-marbled beef. As for what determines tenderness, research evidence has been pointing to inheritance; in fact, the heritability factor of .71 for tenderness shows that a great deal can be accomplished through selection and breeding.

Experience is the name men give to mistakes.

It was at this point—what carcasses will yield in cuts of greatest value—that a meat packer, Armour and Company, entered the picture. Being one step closer to the retailer and consumer and feeling the increasing pressure from the retailer for a greater proportion of lean to fat, and for much more uniformity in conformation, tenderness, juiciness, flavor and color, Armour created

Beef Cattle Improvement Research, now called BCI. The underlying idea was to find the best performance—and progeny—tested bulls available and spread rapidly and widely their use through artificial insemination. In that way, one outstanding bull could stamp his good characteristics on 5,000 or more calves a year.

To tackle such a big problem, BCI asked for the cooperation of the livestock producer. This joint venture meant pooling the production facilities and know-how of the producer with the processing, distribution and scientific facilities of the packer.

For three years, cooperating producers have been keeping herd records like sire, cow and calf identify and weaning weights, while BCI through feedlot and slaughter tests has been collecting data on rate of gain, feed conversion efficiency, grade and cut-out values. These data are now being shared by both parties to the agreement.

A sire-testing arrangement, called Codding-Armour Research, has been set up on the ranch owned by Charles Codding and sons, Charles, Jr., and Don, near Foraker, Oklahoma. The Coddings are pioneers in performance and progeny testing.

At Codding-Armour Research, promising bulls are mated with groups of 30 to 40 uniform Hereford cows. The progeny are fed and slaughtered, and the bulls then are evaluated as to how well the progeny have done.

Through testing of bulls in commercial cow herds and at Codding-Armour Research, it has been found that even the most promising bulls fail to qualify in all respects. Some may sire calves that gain rapidly and efficiently but which are low in the ribeye area, have too high a fat to lean ratio, or do not have enough of the carcass weight in the hindquarters. Others may sire calves that grade and cut out well but do not have an impressive weaning weight, or fail to gain as rapidly or efficiently as they should. A satisfactory balance of these factors, all wrapped up on one package, is required. Only bulls that qualify in all of these respects are eligible for the BCI stud.

Farming is a business. Treat it as such.

Another development from this research is a sire-ranking index, based on how the bull's progeny perform in 10 production and carcass traits. This affords a realistic way of retaining or eliminating bulls on the basis of their over-all value from ranch through feedlot to packing plant and retail store. It's definitely a

"sperm-to-steak" program. Research has progressed to a point where semen from top bulls is being made available to a wider group of stockmen than those engaged in the basic study.

The serious nature of this carcass quality problem can be fully appreciated when you realize that these factors cannot be measured on the individual himself and it is necessary to wait until his progeny are slaughtered and hung on the rail.

So far, the only way to evaluate a sire for carcass cut-out values and keep him alive for future breeding is through progeny testing. This method is slow—takes over two years.

An ultrasonic method of looking under the animal's hide at the steaks underneath has been under test at Colorado State University, Cornell University and the Southwest Research Institute. The instrument bounces high-frequency sound waves off the layers of fat and lean. The time required for the waves to make the round trip is converted into distance which provides an estimate of the thickness of fat and lean. At Cornell, the picture of the rib-eye or some other cut is made by passing these sound waves through a cathode tube.

The development of new breeds, along with inbreeding and crossbreeding, comprise another phase of the over-all breeding program.

1962 ACP To Include Practices Beneficial to Wildlife

Soil and water conservation practices especially beneficial to wildlife have been made a part of the 1962 National Agricultural Conservation Program approved recently by Secretary of Agriculture, Orville L. Freeman.

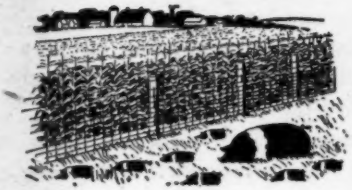
Under the program, assistance is provided farmers and ranchers in carrying out needed practices on their farms and ranches. These practices are in addition to other soil and water conservation practices included in the ACP in recent years.

Wildlife practices will be developed locally in consultation with State wildlife agencies, and will include establishment of wildlife food plots or habitat, ponds and shallow water areas, and other practices which provide substantial soil and water conservation and wildlife benefits.

The Secretary pointed out that through these wildlife practices, and the wildlife benefits provided by other ACP practices, the 1962 program will help farmers and ranchers increase the already substantial contribution they have been making to the conservation of wildlife.

—New Mexico Farm, Ranch News

The Case of Pasture In Modern Hog Production



There are still advantages in favor of raising hogs under pasture management . . .

Condensed from
The American Hampshire Herdsman
Hobart W. Jones, Purdue University

THE trend to confinement rearing of pigs implies a switch away from pasture or range feeding.

This trend has been pronounced within recent months. That this system of management has virtue cannot be questioned. To so state that this system is a must for every man involved in the production of swine would be in error.

There exists now two excellent alternatives for the management of swine instead of just one and the able manager will wisely choose between them. Contrary to many opinions, I feel that neither system will monopolize swine production for years to come. In view of the fact that the pasture system has been used for years, it has been given the tag of an antiquated method by some. This is unfortunate in light of the fact that there still remains some decided advantages in favor of producing hogs under pasture management.

An interesting factor in this connection is underscored, in my mind, by a study conducted at Purdue by R. H. Bauman, Department of Agricultural Economics. In this study it was revealed that peak levels of performance in swine production were accomplished in herds of from 50 to 60 sows. Even more interesting was the fact that a study of low cost producers in various sized herds revealed that the lowest total unit cost was attained at about the 30 sow level. The foregoing data reflects the favorable competitive position of good farm herds. In addition it would seem quite feasible that most farms supporting herds of the size mentioned could quite likely justify the allocation of from 10 to 30 acres of land suitable for forage production to a swine management system without creating

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undue strain on the production of cereal grains.

As was stated before, advantages for pasture rearing still prevail, making the case for pasture production one that should challenge everyone to careful consideration of its virtues.

To me one of the most striking advantages of pasture production is the preservation of flexibility. I believe this advantage is of particular consequence to the many young men who elect farming as an occupation each year. Renting is almost an absolute necessity for a young man starting out with limited capital. Capital expenditures of magnitude or reluctant landlords do not necessarily exclude the opportunity of deriving farm income from the swine enterprise when maximum pasture utilization is practiced.

There are other factors such as disease outbreaks, human health, caliber of labor, general economics and others that are not to be forgotten before flexibility is sacrificed.

Already inferred in the foregoing discussion is the factor of capital invested. Pasture management affords a given operator the opportunity to forestall or postpone the outlay of sizeable expenditures for buildings and equipment until he consolidates his financial position or can prove himself beyond a shadow of doubt that the permanent facilities common to confined rearing are the best alternative for money borrowed at a given rate of interest or for money that has been accumulated for improvement or expansion purposes.

Relative feed costs for producing 100 lbs. of pork will always be an important factor in swine production because of its high share of the total production cost. As a consequence, feed costs under pasture management and feed

It is fine to get up in the world, provided it does not make you look down on others.

costs under confined conditions in the growing-finishing pig have been studied quite widely. There appears to be unanimity of opinion that pasture as such has some value as a source of nutrients for growing-finishing hogs.

The dollars and cents value of an acre of pasture for hogs is not too easy to set forth because of the wide variation in quality and quantity of the forage. The population per acre, length of pasture season, relative price of protein supplements, size and weight of the hogs and similar factors all enter into the proper evaluation of the pasture system. Although not specific enough, it can be said that on pasture of excellent quality and quantity pigs that are thrifty and weaned at heavy weights, can return reasonably

satisfactory net profit for pasture consumed. That some acres will return greater profit under alternate cropping programs, again cannot be questioned. However, pastures are a soil conservation consideration, and a source of one of the most complete feeds known to exist.

The protein, vitamin and mineral content of pastures is widely acclaimed. Interesting to note is the fact that the protein, vitamin and mineral supplements added to the rations of swine are the ingredients that call for the greatest outlay of money on a unit basis. Pastures continue to be a reliable dietary constituent for swine growers who are properly concerned with well-balanced, well-fortified rations for the growing-finishing period. When confinement conditions prevail, the swine grower must accept responsibility of providing in a ration the basic nutrients known to be essential if maximum efficiency is realized.

Up to this point we have considered only swine in the growing-finishing stage. In view of the fact the hog is an animal with a simple stomach, their capacity for the consumption of fibrous feeds high in moisture is limited. Logically this factor would tend to indicate that pasture is most efficiently utilized by animals of advanced growth or by the sow herd during the gestation or lactation period. When thinking in terms of net return per acre of pasture, it is reasonable to assume that older growing and finishing hogs or the breeding herd will consume forages in a manner more advantageous to the farm operator. This can be a valid consideration when assessing a pasture program in terms of net return to a given farm operator.

Records or data that accurately reflect a comparison of labor requirements for confined conditions versus pasture conditions are, in general, lacking. It can generally be said, however, that more man hours per hundred pounds of pork produced are required under confined conditions. If more man hours are not required then certainly more investment in mechanical equipment has been made. Most labor expenditures are common to both pasture and confined conditions, however, the principal difference in total requirements arises from the task of properly removing the excrement from the areas of confinement.

The inefficient use of farm machinery can be a heavy contributor to lower farm income. Good farm machinery records provide the information needed to improve machinery efficiency and farm income.

It has been estimated that approximately 15 to 18 tons of liquid and solid manure are produced annually for each 1000 pounds of pork. This tonage creates a real problem for its disposal under confined conditions. Although hogs on pasture may spread manure rather poorly, handling the materials other than those used for bedding houses is relatively uncommon. Generally speaking confined systems of management have witnessed greater expenditures of labor than have pasture systems. Labor in most areas continues to be a critical item from the standpoint of both cost and quality.

One final consideration not to be forgotten in the selection of a management system is the quality of the end product. Considerable research tends to indicate that those animals reared under a range or pasture program are somewhat higher in their percentage of the lean cuts inasmuch as their backfat thickness is significantly less. This advantage will probably be overcome in the near future as swine breeding improves heavy muscling tendencies in our replacement animals. It is a significant factor at present.

Decreasing the costs of production appears to be a more fruitful field for increased profit than does increased volume. If this fact continues to be true, all swine growers will need to be super-critical of feeding practices, labor expenditures and investments in equipment. Pasture management offers advantages in all of these aspects of production costs.

The Hay That Stays on the Ground

"Part of the cost of producing every ton of hay is that part which never gets off the ground," Agricultural Engineer Lester F. Whitney of the University of Massachusetts recently told members of the American Society of Agricultural Engineers. Whitney reported no wide difference in losses between bailing operations and chopping methods of harvest. Final harvest operations are relatively efficient when compared with the losses during rake and mower operations. He pointed out that total losses from these hay harvest systems as they now exist may easily be in the range of 7-12 percent. It is this realization which appears as the most significant result of these studies. For, if the inherent inefficiencies of the systems studied are universal, the loss to agriculture is staggering when based on an annual 2 billion dollar hay crop. —*Better Farming Methods*

Inoculation Still Pays

With proper inoculation your legumes take free nitrogen from the air . . .

Condensed from Pennsylvania Farmer

Clarence S. Bryner

MOST farmers have a productive nitrogen plant on their farm if they grow properly inoculated and fertilized legumes. Efficient production of alfalfa, birdsfoot trefoil, red clover, ladino clover, soybeans and other legumes is dependent on inoculation with productive strains of legume bacteria. Efficient production is also dependent on proper liming and fertilization.

Legume bacteria live inside growths known as nodules which form on the roots of young seedling legume plants as they develop. The bacteria obtain nitrogen from the soil air which is used by the legume plant to build its protein. The legume plants, in return, furnish carbohydrates to the legume bacteria.

This nitrogen transfer takes place efficiently if the seed was properly inoculated, if the soil on which the legumes are growing is well drained, has a supply of calcium, has a pH of 6.5 to 7.0, and if there is an adequate supply of phosphorus, potassium and other plant foods essential to growth. Healthy growth of the legume plants means higher nitrogen extraction from the air which is 80 per cent nitrogen.

Each acre of legumes can extract large amounts of nitrogen if the legumes are inoculated with the proper species of productive bacteria. Alfalfa and sweet clover require inoculation with one species of bacteria; birdsfoot trefoil requires another species; red, ladino and white clover requires another; and so on.

Value Of Inoculation

Legumes adequately inoculated, limed and fertilized can produce the following amounts and values of nitrogen per acre:

Reprinted by permission from Pennsylvania Farmer, Harrisburg, Pennsylvania

Legumes not adequately or properly inoculated will not extract much, if any, nitrogen from the air and will return lower yields unless fertilized with purchased nitrogen fertilizer. Similarly, lack of inoculation will produce legume crops with a lower protein content.

NITROGEN FIXED BY LEGUMES

Crop	Aver. Pounds Nitrogen Fixed Per Acre (1)	Aver. Value Nitrogen Fixed Per Acre (2)
Alfalfa	194	$23.28
Red Clover	114	13.68
White Clover	103	12.36
Soybeans	58	6.96

(1) Average pounds of nitrogen fixed, obtained from USDA Farmers Bulletin No. 2003 "Legume Inoculation."

(2) Nitrogen valued at $.12 per pound.

Cost Of Inoculation

If a farmer purchases the legume inoculant (50 cents per bushel size) and applies it himself, his acre cost runs about eight to thirteen cents per acre depending on whether he seeds six acres or four acres with a bushel of seed. If he uses preinoculated seed, which usually costs $1.20 per treated bushel, his acre costs will amount to 20 to 30 cents per acre.

If a farmer figures the cost of inoculation per acre and subtracts it from the average value of nitrogen produced per acre, he obtains at least $23 of free nitrogen from the average acre of alfalfa and at least $13 per acre from red clover. Inoculation doesn't cost, it pays!

Types of Inoculating Materials

Legume bacteria are usually cultured in liquids or on the surface of agar. Heavy suspensions of bacteria containing an excess supply of food material are generally mixed in one of the following carriers (1) finely ground humus or peat, (2) agar, (3) liquids. Commercially, most of the inoculants have been prepared in moist humus.

The Cooperative Extension Service was established in 1914 by the Federal Smith-Lever Act. For the most part, it is financed cooperatively by the Federal, State, and county governments —thus the name Cooperative Extension Service.

Seed Inoculation on the Farm

Farmers using peat or humus-type legume inoculants either moisten the seed and mix the black substance with the seed or make a thin paste of the inoculant and pour it on the seed and then mix. If a liquid inoculant

is used, a small quantity of clear, cool water is added and shaken to get the bacteria in suspension. Sufficient water is then added to the suspension to moisten the seeds. In all types of on-the-farm inoculants, add just enough water to slightly moisten all seeds.

The addition of an adhesive (ten per cent syrup solution) has sometimes maintained the bacteria life two to three weeks when planted in dry soil.

For Effective On-the-Farm Inoculation

1. Be sure the bacterial inoculant is prepared specifically for the legume group you wish to plant.
2. Plant before the expiration date stamped on the package of inoculant.
3. Follow the manufacturer's recommendations.
4. Mix the inoculant thoroughly with the seed.
5. Keep inoculated seed away from heat and out of direct sunlight.
6. Plant the seed as soon as possible after inoculation.

Pre-Inoculated Seed

During the past two years the term pre-inoculation has come into somewhat common usage. Pre-inoculation refers to the application of legume bacteria cultures to seed by processors or retail dealers sometime in advance of sale of the seed for farm use. Materials and methods are used which give some assurance of live legume bacteria being on the seed at planting time.

Pre-inoculation of legume seed came about because farmers have failed to take full advantage of inoculation. Field reports have indicated many farmers fail to inoculate their legumes even though many of them know the benefits which can be obtained from it. These farmers object to the effort and time required for on-the-farm inoculation. They also object to the mechanical seeding difficulties which sometimes are experienced in planting farm inoculated seed. One seed company which has been furnishing free inoculant with each bushel of legume seed, reports failure to obtain profitable legume stands because the free inoculant was not used.

Fertilizer nutrients, if properly applied in the correct amounts, will lower cotton disease losses, says an extension plant pathologist.

Seed processing companies and laboratories producing legume inoculants saw the need and market for pre-inoculated seed. Consequently, private research was conducted by several companies to develop an effective pre-inoculation of legume seed. There

are at least four pre-inoculation brand name inoculants or processes being marketed in the eastern United States at the present time.

They are the "Noculized" and "Vicoat" processes; "Dormal" inoculant and "Pre-fixo" pre-inoculation material. Information on their use briefed from printed leaflets obtained from the respective companies follows: All require a brand tag on the seed bag indicating the seed has been inoculated and the expiration date.

"Noculized" brand refers to a process of inoculation. Seed in this process is sprayed with nitrogen-fixing bacteria and vacuum impregnated. Alfalfa seed inoculated under this brand has been available the past two years.

"Vicoat" process is a method which coats the seed with nitrogen-fixing bacteria using special sealing and nutrient compounds. Vicoated seed has been available on alfalfa and clover seed.

"Dormal" brand inoculant contains dormant strains of nitrogen-fixing bacteria that have been kept alive by special processing. It is said not to be adversely affected by various storage temperatures or drying. Seed moisture up to planting time should not exceed 12 per cent. Inoculant is applied as dried powder. "Dormal" inoculant is available this year, pre-inoculated on all varieties of legume seeds.

"Pre-fixo" pre-inoculation material is used with Nodagen humus by large seed processors or small dealers who can custom mix for their customers. Pre-fixo is a coating material containing water soluble gums which in combination with Humus Inoculator forms a protected film of nitrogen-fixing bacteria about the seed.

No Reported Failures

There is no reported case of an alfalfa or clover seeding failure attributed to pre-inoculated seed.

Most. if not all, seed companies selling legume seed will have pre-inoculated seed of alfalfa available very soon. Some companies will have pre-inoculated alfalfa and clover. Some will have all forage legume seed available as pre-inoculated. One large seed company is going 100 per cent to pre-inoculated legumes. That means you can only buy legume seed from them as pre-inoculated seed.

Have plow shares sharpened to avoid the rush at plowing time. Dull plow shares are a major cause of plow sole compaction.

Should You Use Treated Seed?

If you are a legume grower you should use legume inoculation of

some type. If you are satisfied with on-the-farm inoculation and have had success with it, there is no reason why you should change. However, if you hate the mixing or have mechanical difficulty in seeding home-inoculated seed, buy pre-inoculated seed of some type.

Inoculation at 20 to 30 cents per acre is cheap insurance. If you use properly inoculated seed you are sure that lack of inoculation doesn't limit the yield and quality of your legume crop. Obtain your legume nitrogen from the air. It won't cost you, it will pay you!

High Level Grain Feeding Tested

High level grain feeding will not change low producing cows into high producing cows, says L. D. Brown, Michigan State University dairyman. High level grain feeding is primarily for high producing cows. But this does not mean that grain cannot be partially substituted for hay in normal dairy rations.

However, when the potential production of the cow is attained, the amount of total digestible nutrients (TDN) should be limited to just meet requirements, he said. If grain is substituted for hay in this case, the rate of substitution should be on a TDN basis rather than free choice feeding.

Brown recently studied the physiological limits and milk production response on extremely high levels of grain with supplemental roughage. He fed three groups of Holstein cows varying rations of alfalfa hay and grain.

Milk production was used as the principle criterion in evaluating the experimental rations. The estimated production was compared to the amount of milk actually produced during the 260-day experimental period.

When only the higher producing cows are considered, the net return of milk production over feed cost increased as the level of grain feeding increased, Brown said. It appears that high producing cows can utilize high levels of grain for maximum milk production.

When price ratios are such that grain supplies the cheapest source of TDN, more grain should be fed. The grain feeding level should be increased to the point where the additional milk obtained just pays for the additional cost of grain, Brown said.

—Michigan Extension Service

TRACTOR TALK

Bob Bargert

Improper Dipstick May Be Culprit Causing Oil Fouled Plugs

In cases of continued oil fouling of the spark plugs and/or high oil consumption, better check the dipstick to see whether it's the right type for the engine.

Service engineers advise that they have received several reports of cases where the dipstick was too short — as a result, oil was added to the crankcase in excess of requirements. Engineers advise that this condition may also show up as excessive oil blowing out of the crankcase breather.

* * *

Point Spacing Affects Timing

When installing distributor breaker contact points in a tractor, keep in mind that proper point spacing is important. Points spaced too far apart decrease dwell angle and advance spark timing. Points spaced too closely together increase dwell angle and retard timing.

An engine always should be retimed after new points have been installed.

Clogged Air Cleaner May Cause Fouled Spark Plugs

If you're encountering spark plug misfiring on tractor engines with relatively new plugs, it may be due to improper air cleaner maintenance, according to Champion Spark Plug Company engineers.

Pointing to a recent University of Illinois survey indicating that most farmers don't follow recommended procedures on air cleaner servicing. They say, a dirt-clogged filter easily can result in a rich fuel mixture which will cause the formation of carbon deposits on the spark plug electrodes. The resultant spark plug misfiring will reduce horsepower, fuel economy and contribute to excessive engine wear.

Farmers are reminded that most tractor manufacturers recommend daily service of the air cleaner cup, and removal of the cleaner from the tractor at least once a year for complete cleaning and rinsing of the filter element.

According to the Illinois study, only about a third of the tractor operators surveyed bothered to clean the cup oftener than once a week. Fifty percent said their interval between cleanings was 60 hours or more, while 50 percent said they had never removed the filter for cleaning.

Regular air cleaner service is extremely important to tractor operation. Dirt collecting in the filter element can reduce horsepower, waste gas and result in excessive engine wear. In the Illinois test, for example, intake valves from tractors receiving poor air cleaner service showed three times the wear as those in tractors receiving proper service. Cleaner neglect also accelerates wear of rings, pistons, sleeves and bearings.

Engineers advise servicing the oil cup daily, cleaning the center pipe monthly and removing and cleaning the entire filter at least once a year.

* * *

Tractor Maintenance Pays Off!

Did you know that improper tractor engine maintenance is costing U. S. farmers $.15 out of every dollar they spend for fuel?

If you run your tractor 600 hours a year (that's the national average), you are spending $375 for gasoline, but waste $56.25 of it by not paying closer attention to the routine maintenance chores that should be taken care of at regular intervals. Most of the conditions that cause a tractor to waste gas originate within the ignition and fuel systems — with dirty air cleaners, incorrect timing, bad carburetion and worn spark plugs topping the list.

If your tractor seems to be using more gasoline than usual, a check of the following areas may save you some money:

1. *Air Cleaner* — Check and clean reservoir frequently, daily if necessary. Service entire unit at least once a season and oftener if the tractor is used under extremely dusty conditions. Remember operating a tractor with a clogged air filter is just like running with the choke open.

Bank on the future — but don't write checks against it.

2. *Fuel filter and sediment bowl* — Inspect daily and clean weekly. Watch for dirt and water in the bowl. When replacing bowl, make sure gasket surfaces are in good shape to prevent leaks.

3. *Distributor* — Inspect and adjust breaker points at about 100 hours and replace every 250 hours. When servicing old points, use a point file (never sandpaper) to remove pitting. Set gap spacing in accordance with manufacturer's specifications and always retime the engine after

points are installed. Check inside of distributor cap for cracks, dirt and moisture.

4. *Spark plugs* — Clean after 125 hours of service. Remember, worn plugs can waste $.07 out of every dollar's worth of gas you buy and almost 9 percent of your tractor's power. Some authorities recommend replacing after 250 hours.

5. *Cooling system* — Check condition of fan belt, radiator hoses and thermostat. Either overheating or underheating will cause poor overall performance and greatly increase engine wear.

* * *

Wide Gap May Cause Miss Under Load

Got a tractor that's missing when you're plowing under a full load? It may be that you're setting the spark plug gaps too wide — or allowing the gaps to erode without periodic cleaning and resetting.

Engineers at Champion Spark Plug Company advise that correct gap setting is particularly important on tractor engines, since for the most part, they are operated under full load almost continuously, and thus are more sensitive to any of the various conditions that "drain" voltage output away before it reaches the plugs. This condition may be even more aggravated if the ignition coil is not designed for a wide plug gap load.

Too little distributor cam dwell angle — improperly spaced or burned points and weak breaker point springs — any one of which can prevent the ignition coil from building up maximum voltage also are frequently the cause of misfiring under load. Other culprits that may cause this condition include defective high tension wires, worn distributor bearings, improper carburetion or a defective fuel pump.

ASCS Grain Loans Easier To Get

A new method of handling ASCS grain loans should save farmers a lot of time. It is now possible for a farmer to negotiate a loan in only one visit to his county ASCS office, authorities say.

The farmer notifies the county office either in writing or by phone that he is interested in getting a loan. The office then sends a loan inspector to the farm to get all information needed in processing the application. Once the information is reviewed and the loan approved, the farmer is notified by mail. He can then visit the office and receive the proceeds of his loan.

Support rates on all grains have been increased.

—North Carolina Extension

Moldboard Plow or Rotary Tiller?

They do different jobs. The rotaries have been changed and improved . . .

Condensed from Wisconsin Agriculturist

Melvin E. Long

LONG a controversial subject, the rotary tiller is gaining new popularity among many farmers.

Some early rotary tillers acquired a "bad" reputation. Such complaints as high power requirements and excessive pulverization of the soil detracted from their promised advantages.

However, in recent years manufacturers have learned how to build better machines, and farmers have found how to use them.

A rotary tiller should not be considered as a direct replacement of a moldboard plow. Instead it must be part of a planned system of revised farming methods.

First, let's consider the basic differences in construction and operation between a moldboard plow and a rotary tiller.

A moldboard plow cuts, lifts, and inverts a continuous strip or ribbon of soil. Surface trash is usually buried at the bottom of the furrow. In order to lift the ribbon of soil, the plow must push down on the soil beneath it. This downward force tends to seal the soil. Since successive plowings are usually about the same depth, a compressed layer or plowpan develops. This plowpan prevents penetration of roots and moisture into the subsoil.

The rotary tiller consists of a power-driven horizontal shaft (mounted crosswise of the direction of travel) on which L-shaped blades are mounted. The shaft is powered through a gear train from the tractor power take-off, or in the case of some large size units, from a separate engine.

The forward edge of each blade cuts the soil with a slicing action and excavates a crescent-shaped bite of earth. The size of the bite depends upon shaft speed and forward speed of the tractor.

The following blade slices this bite of soil again and turns it upside down.

The blades follow a circular path in cutting the soil. No flat

Reprinted by permission from Wisconsin Agriculturist, Racine, Wisconsin

downward pressure is produced to form a plowpan.

Use of the rotary tiller can be divided into three general areas—turning in residues, seedbed preparation, and pasture renovation and reclaiming of waste land.

Turning in residues. Crop residues — fodder, stalks, leaves — should be returned to the soil to rot down into humus and improve the soil structure. The rotary tiller is especially effective at this work. The residue is cut, chopped, and buried evenly through the entire depth of cultivation. Some residue is left on the surface, to provide protection against water and wind erosion.

Additional nitrogen fertilizer should generally be applied to encourage the bacterial action necessary for decomposition of the residue. This extra nitrogen will eventually be available for use by the following crop.

Seedbed preparation. This is the type work in which the rotary tiller is most often compared with the moldboard plow. The first season that a rotary tiller is used, it will probably be necessary to go over the field at least twice.

However, users report that seedbed preparation becomes easier with continued use of the tiller.

Some farmers who are following a continuous corn system proceed like this: (1) After the corn is picked, turn in the fodder in the fall. (2) Next spring till several inches deep about two to three weeks before planting time. (3) Allow weed seeds to germinate and then till at a shallow depth just ahead of the planter.

Renovating pasture. Old matted pastures can be renovated by rotary tillage. The blade action chops and turns the root mat and lets air into the soil. Special blades are available for use in renovating alfalfa.

Brush land can be reclaimed by rotary tillage. The soil surface is left in a condition suitable for seeding to grass.

A light top dressing of manure on thin, light-colored soil protects legumes being seeded in wheat. The manure should be applied during February when the ground is frozen.

Runner-producing weeds like quackgrass or bindweed can be controlled by making a shallow cultivation and allowing the weed growth to wither in the sun. A second tillage about two weeks later will destroy regrowth.

Mechanical details of tillers. There are many shapes and types of tines available. None are ideal under all conditions. The hook or pointed tine is best for deep tillage in clean ground. However, this type is subject to wrapping when operated in heavy cover

crops. Knife tines are better for trashy conditions.

To reduce tine breakage and bending in hard or stony ground, some rotary tillers are provided with resilient tines, spring mountings, rubber mountings, or resilient couplings in the drive. Machines using rigidly mounted knives depend upon a slip clutch for protection.

Controlling pulverization. One of the primary faults of the early machines was the over-pulverization of the soil. Degree of pulverization is controlled by the amount of forward travel per slice and the condition of the soil and cover crop being worked.

In order to meet varying requirements, many rotary tillers have provision for easy changing of the rotor speed in relation to forward travel.

Available sizes and types. Width of cut varies from 28 inches to 90 inches. Small models are available in tractor-mounted or pull-type arrangements, and are powered by the tractor PTO. The larger sizes are generally powered by a separate engine. The higher power available in today's tractors has encouraged the use of PTO models.

Power requirements. For tillage speeds to 1½ to 2½ miles per hour, 10 to 15 horsepower per foot of width is required. The exact requirements, of course, vary somewhat with soil conditions. Rotary tillage requires more horsepower-hours per acre than does moldboard plowing.

The total requirement per acre is about equal to that required for plowing, discing and harrowing. However, since rotary tilling replaces all these steps, the total power per acre for complete seedbed preparation is about the same.

Cost. Rotary tillers are more expensive than plows. Their rugged construction costs money. Exact prices are difficult to quote because of the many options and arrangements available. In general the price of a rotary tiller will be about equal to the plow, disc, and harrow combination which would have equal capacity in terms of seedbed preparation.

"The basic wealth of any nation is in its topsoil. When the topsoil is fertile and well cared for, the farmer usually fares well, but where the topsoil is scant or poorly drained, the people are usually not so well off." SCD Newsletter.

Recommendations. A survey of literature from several midwestern agricultural colleges reveals only limited approval for rotary tillage.

Many farmers report favorable results. If you are considering rotary tillage, one way of obtaining

information is to visit with other farmers in your area who have been using the method. You may have to try the system on your own farm before you obtain the final answers.

Fertilizer Interchange Guide

100 lbs. of 10-10-10 is equal to or can be replaced by:

83 lbs. of 12-12-12	
77 lbs. of 13-13-13	Ratio: 1-1-1
143 lbs. of 7-7-7	
125 lbs. of 8-8-8	

100 lbs. of 10-20-10 is equal to or can be replaced by:

200 lbs. of 5-10-5	
167 lbs. of 6-12-6	Ratio: 1-2-1
125 lbs. of 8-16-8	
83 lbs. of 12-24-12	

100 lbs. of 10-20-20 is equal to or can be replaced by:

200 lbs. of 5-10-10	
167 lbs. of 6-12-12	Ratio: 1-2-2
125 lbs. of 8-16-16	

100 lbs. of 0-20-20 is equal to or can be replaced by:

167 lbs. of 0-12-12	
143 lbs. of 0-14-14	Ratio: 0-1-1

100 lbs. of 0-15-30 is equal to or can be replaced by:

125 lbs of 0-12-24	Ratio: 0-1-2

Ratios you may care to use; not recommended:
1-2-3, 1-3-3, 0-2-1, 1-4-4

100 lbs. ammonium nitrate 33.5% nitrogen is equal to:

163 lbs. ammonium sulphate	20.5%	N
159 lbs. calcium cyanamid	21%	N
209 lbs. sodium nitrate	16%	N
84 lbs. urea	40%	N
73 lbs. urea	46%	N
100 lbs. nitrogen solution	32%	N
82 lbs. nitrogen solution	41%	N
41 lbs. anhydrous ammonia	82%	N

100 lbs. superphosphate 20% P-2, O-5 is equal to:

111 lbs. superphosphate	18%	P-2, O-5
44 lbs. triple superphosphate	45%	P-2, O-5

—Suffolk County Farm News

A Growing Problem — Soil Compaction

What it is and what can be done to prevent it.

Condensed from Soil and Water Magazine

Ernest T. Smerdon, Texas A & M College

IN RECENT years we have read about many problems that confront the farmer. Undoubtedly, some of the problems have arisen as a result of the many changes which have occurred in agriculture.

Technical advances in agricultural production practices have possibly led to some of these problems. In some cases, perhaps the problems are not becoming more severe, but are merely more readily recognized. In other cases, some change in the farming operation may be causing the problems to increase. The problem of soil compaction may fall into either or both of the above categories.

Soil compaction is a problem which is becoming more apparent in present-day agriculture. If the problem is to be prevented or controlled, we must better understand the effects of soil compaction on agricultural soils and why the problem exists. Agricultural engineers are engaged in research to develop better machine designs for preventing and alleviating soil compaction problems. Similarly, soil scientists are working to better understand why compaction zones form. This research will help to develop management practices to prevent compaction. Although the causes of soil compaction are complex, due to the many different types of soil and compaction zones, the prospects are good that the problem can be solved.

The presence of compacted layers has many harmful effects on agricultural soils. The compaction zone impedes the downward development of plant roots through the dense layer. In many cases, no root development occurs in or through the compact layer. Therefore, the plant roots are not able to penetrate to the deeper levels of the soil profile to obtain moisture and plant nutrients.

Reprinted by permission from Soil and Water Magazine, Soil and Water Conservation, Inc., 309 First National Building, Temple, Texas

The crop grown on a soil with severe compaction cannot be expected to yield as well as that grown on a soil without compaction.

Another result of compaction zones is to reduce the downward movement of water in the soil. Therefore, during periods of excess rainfall, the amount of water which enters the soil is reduced. This leads to greater runoff and erosion than would occur if the compaction zone were not present. In addition, due to reduced water intake, soil moisture deficiencies may develop later, during the growing season, causing decreased crop yields. Other harmful effects of soil compaction result from the reduction in the amount and movement of soil air in the compacted region. This disrupts the soil-plant relationships necessary for a highly productive soil.

The problems resulting from soil compaction seem to be more severe each year. In some areas the problems resulting from compaction zones have been generally recognized only for a very short time. In other areas, the presence of compaction zones has been recognized for many years, but attempts to reduce the problem were often unsuccessful until recent years.

Types of Compaction Zones

Soil compaction zones have been referred to in the past by several different terms. Some of these are "compaction pans," "plowpans," "hardpans," "claypans," and "traffic soles." Some compaction zones are naturally present and are developed by natural processes within the soil. These are classed as natural compaction zones. Other types of compaction zones are artificially developed in the soil. These are referred to as induced compaction zones.

The natural compaction zone: In some soils there exists a layer below the surface which has, through the ages, developed into a natural compacted zone. This compacted zone may be a naturally dense clay layer (claypan) which inhibits the percolation of water and root development. In other cases, the problem zone may be an impervious layer of soil which has actually become cemented by natural cementing agents in the soil. Natural compaction zones may also result from a number of other causes.

Minds are like parachutes. They only function when open.

The induced compaction zone: In many soils where the compaction zones have appeared only recently. The cause is due to some recently applied compacting force. The increase in the rate of development of these induced compaction zones appears to be

related to a change in farming practices which has occurred recently. The cause may be the increased usage of heavy machinery and the tendency to till the soil more. Also, with large machinery, larger areas can be tilled immediately after the fields become sufficiently dry for tillage operations. In many cases, tillage of the soil under these conditions leads to very significant compaction of the soil.

Keep your face to the sun and your shadows will fall behind.

The rate, and ease of formation, of compacted zones in a soil subjected to any given compacting force is related to the moisture content of the soil. This knowledge has been used by engineers in constructing earth dams and highway fills where the maximum possible compaction of the soil is desired. In this case, the moisture content of the soil s controlled in order to achieve maximum compaction. Studies have shown that, at least for some soils, the optimum soil moisture content for tillage is approximately the same as that which gives maximum soil compaction for any given compacting force. This is disturbing, since tillage operations with soil at an ideal moisture content for tillage may lead to excessive compaction.

Other studies have shown that the ease with which induced compaction zones are formed in soils, is also related to the organic matter content of the soil. Soils with a high content of organic matter are less susceptible to the formation of compaction zones than soils low in organic matter. It is probable that an interrelationship exists between the ease of compaction of a soil and its moisture and organic matter content. However, this relationship will vary with other properties of the soil. It may be useful, though, in understanding why certain cultural and tillage practices tend to aggravate compaction problems while others prevent or reduce them.

Symptoms of Compaction Zones

It is often difficult to recognize the presence of compaction zones by superficial observation. However, there are certain signs which may indicate that induced compaction zones are developing.

In some cases, fields which at one time had good internal drainage, show tendencies to remain wet for long periods after rains. This may indicate that a compact impermeable layer of soil is developing below the surface Sometimes the presence of a compact zone can be detected by digging a trench in the soil and carefully observing the soil for evidence of dense layers. In the case of induced compaction

zones, the dense compact layers will generally develop just below the normal depth of plowing. In irrigated areas, the evidence of developing compaction zones may come from a significant reduction in the infiltration rate of the soil from year to year.

All of these methods of determining soil compaction by casual observation are only useful to indicate the probable presence of a compaction zone. More reliable information on the presence of a compact layer must come from actual soil measurements. The bulk density determination is the most common measurement for the presence of a compaction zone. Bulk density is the ratio of the weight of a given volume of dry soil, including pore space, to the weight of an equal volume of water.

Bulk density values for soils will range widely, but may be as low as 1.0 for a loose, recently tilled soil, and as high as 2.0 or greater for a dense compacted zone. Research scientists have reported that the root development of plants in some fine textured soils begins to be retarded when the bulk density becomes much greater than 1.4. For coarse textured soils the root development may begin to be restricted with bulk densities as low as 1.6.

Soil Compaction Control

Compaction zones may develop in a very short time, particularly if good soil management practices are disregarded. As mentioned before, the ease with which the soil becomes compacted is related to the moisture content and the organic matter content of the soil. Thus, tillage or traffic over the soil when it is excessively wet are likely to more rapidly develop compaction zones. The importance of minimizing tillage operations and traffic when the soil is very moist cannot be overemphasized. If the soil is sufficiently wet so that it can be molded into a dense ball or can be rolled into a wire-like form approximately a quarter of an inch thick, it is too wet for tillage or traffic.

Ponds of about one acre in size are more likely to provide satisfactory fishing than half-acre ponds.

When possible, compaction zones should be prevented instead of cured. A careful study of the soil moisture content before carrying out tillage operations will aid in preventing compaction. The concept of "minimum tillage" can be helpful by planning the farming operation so that a minimum number of trips across the field with heavy equipment are required. Often weed control by the use of pre-emergence and post-emergence sprays will be helpful in decreasing amounts of tillage necessary in the field.

In addition to minimizing the tillage and traffic on wet soil, the organic matter content of the soils should be kept as high as possible. Crop rotation with grasses and deep rooted legumes are helpful in the prevention and control of compaction zones.

In some soils it is likely that compaction zones may tend to develop with usage of heavy modern farm equipment even though good soil management practices are followed. Also in some cases the compaction zone may be well developed before detected. Or possibly the compaction zone may result from natural causes instead of being induced by poor soil management. In these cases the compaction zone must be destroyed by some type of sub-surface tillage or subsoiling.

In recent years, agricultural engineers have made progress towards the development of improved designs of machines for subsurface tillage. In general, the power requirement for subsurface tillage equipment is very high. Thus, the best possible equipment should be used. For best results the subsurface tillage machine should shatter the compact layer. Often the subsoiler will provide more complete shattering if "wings" are attached forming a deep running large sweep. These "wings" on the subsoiler generally do not require a great increase in the power. It has also been found that a subsoiler with a straight vertical shank requires greater power than one with a shank which is curved or inclined forward.

The shattering of the compaction zone due to subsoiling operations is greater when the soil is dry than when wet. In fact, subsoiling when the soil is too wet often shows little reduction in the degree of compaction. Therefore, the subsoiling operation should be performed when the soil is as dry as possible.

When the March winds blow watch those open doors, broken windows, and large cracks in the dairy barn. Drafts chill the udders of high-producing cows and mastitis often results.

Compaction zones may quickly redevelop after a subsoiling operation if plant roots do not grow into the shattered region to develop channels and add organic matter. Often the growth of plant roots into the shattered zone can be increased by deep fertilization. In some soils little improvement in conditions results from subsoiling operations unless deeply placed fertilizer is used. However, this will depend upon the individual soil conditions, and the level of fertility in and below the compact zone.

Although past research has come a long way toward answer-

ing problems which result from soil compaction, there are still areas of needed research. The problem will likely be further aggravated with a continued trend toward heavier farm machinery. In addition, the trend toward more intensive agricultural irrigation in some areas of the country will possibly lead to increased soil compaction problems. In line with this need, the Texas Agricultural Experiment Station has active research projects studying the causes and method of prevention of soil compaction problems.

For the present, soil compaction can best be controlled or cured by proper soil management practices. These include the use of crop rotations, subsoiling (often with deep fertilization), and avoiding excessive tillage operations and traffic when the soil is wet. In some cases, the soil compaction problem may be severe enough to require an investigation by an agricultural engineer or soil scientist.

Sprouted Oats For Cattle Tested

Feeding sprouted oats to dairy cattle in an experiment at Michigan State University caused no apparent nutritional improvements in the cattle on the test rations, says J. W. Thomas, dairy researcher.

During the last 100 years there have been several periods when some kind of apparatus to sprout oats for feeding has been available to farmers. Presently there are several sprouted-oats machines or hydroponic units on the market.

"If any advantages do exist for these machines, they must be very small or inoperative under normal conditions of cattle management," Thomas says.

Sprouted oats did not increase milk production during the tests when fed in addition to a usual heavy grain ration, but they did increase production when the cows were fed a limited amount of grain. The cows responded only when slightly underfed.

The dairyman says that the digestible energy and digestible dry matter of the sprouted oats was less than that of original oats. The sprouted oats also contained less total digestible nutrients and showed a 10 per cent decrease in digestibility due to sprouting.

—Michigan Agricultural News

Little Known Facts About Cow Behavior

You must understand a cow to take good care of her

Condensed from Holstein-Friesian World

Melvin Scholl

OFTEN falsified and maligned, the dairy cow offers a course of study in behavior and habits that will make us better and richer dairymen.

More efficient production can be attained by knowing more about the temperament of the cow and by catering to that temperament.

The dairy cow has come a long way since she first gained a foothold in the United States in 1611. The colonists early discovered that if they were to survive the rigors of the new continent they would have to bring cows from across the sea. The cow followed the pioneers into the West. She became an indispensable part of frontier life. Later the family cow gave way to the small dairy herd. From that unpretentious beginning, dairying has grown into big business. Today it ranks on an annual gross income basis with American Telephone and Telegraph and U. S. Steel.

The greatest advances in dairying have come, however, within the past twenty years with open-shed housing, milking parlors with pipeline milking, bulk tanks, gutter cleaners, mechanized machinery for growing, harvesting, and storing forage crops, etc. To pay for this costly equipment, dairy herds have become larger and individual production has registered phenomenal gains. The next twenty years will see even greater changes in the dairy scene.

In many respects the cow herself has changed. The cow that cannot adapt herself to the mechanical procedures of the milking parlor must give way, we are told, to the dairy cow that can consume her grain in a minimum of time, milk out easily, rapidly, and completely, maintain a tractable disposition — in other words, a cow that can "take it."

Reprinted by permission from
Holstein-Friesian World, Corse Press Building, Sandy Creek, New York

Genetics, the science of heredity, will see that such a cow develops. Yet man can do only a few kinds of things to change the heredity of his animals. By their very genetic nature, no two cows (except identical twins) were ever born exactly alike nor ever will be. In fact, it is this variation, this factor of individual differences, which is the raw material with which the breeder works. No matter how hard we try or how desirable it might be commercially, we will never be able to run off a batch of assembly-line dairy cows. This truth is at once the hope and finality of our industry: We shall always have to consider the individual differences of the cows we milk. Perhaps in the future we shall have to pay more attention to this side of dairying. In human affairs, psychiatry and psychology are becoming of increasing importance in our lives as civilization becomes more advanced and complex. This may become true in dairying likewise.

Cows Are Emotional

Cows invariably reflect the tensions of their masters and the people around them. Anyone who has had long experience with cows can tell the minute he steps into a strange barn what kind of dairyman the owner is. Neurotic animals are becoming more common every day as human life becomes faster-paced. Veterinarians all over the country will tell you the same thing. The wise vet today will consider the stress factor in each case he is called in on. It's becoming standard but questionable procedure now to prescribe tranquilizers for dairy cows. Little wonder, though, they need sedatives to exist in the crazy environment we've created for them. The inference here is that we can expect an increasing incidence of nervous ailments in our dairy cattle as we alter their environment, crowding them into smaller spaces—and as people themselves become more mixed up. With pressures building up in our dairy cattle (producing more milk, forcing them to run through milking parlors at a pace against their nature. etc.), we can expect a rise in diseases, and it is not impossible to suppose that in destroying instincts and drives in them we are producing "shy" breeders.

We have committed the Golden Rule to memory. Let us now commit it to life. —Edwin Markham.

In fact, research already conducted at the University of Illinois and Ohio State University has shown that a highly nervous cow, or an unusually placid cow, is harder to settle by artificial insemination than a cow of normal temperament. There is a sound

physiological reason for handling cows with patience: They have a well-developed nervous system and are subject to emotions, reacting strongly to rough treatment — the body functions concerned with milk production, digestion, and reproduction operate at a low level when disturbed.

Patience and understanding are especially needed at calving time, when a cow's disposition and nature change markedly. She fusses and fidgets, refuses to eat, and if she is outside, invariably prefers to go wandering off by herself. From a docile creature she is on occasion suddenly transformed into a bovine shrew. I knew one cow that made up her mind to have her calf in the pasture and no barn door could hold her inside.

There Are No Bad Cows . . .

My own philosophy has always been that there is no such thing as a bad cow; there are only bad herdsmen. The first criticism I hear is this: "Why put up any more with bad-humored animals? Get rid of them. We haven't the time to spend with them." True enough, and we should breed from cow families that have good dispositions. Nevertheless, the fact still remains that the more we push for higher production the more temperamental our animals become, and any animal can be made nervous and irritable by faulty handling.

Though no oral communication in its strictly literal sense is possible, cows have a telepathic sense of perceptiveness of people. This is not sheer speculation, but is based on well-documented scientific studies. Cows know almost instantly whether you are afraid or if you love them. An eminent animal psychologist has said that animals smell fear and enmity in people, and I am inclined to go along with this theory. Ever notice the first thing a cow does to a stranger is turn around and take a whiff of him? Smell must play a large part in a cow's finding her stanchion unerringly in a barn where there may be anywhere from a dozen

There are 3,703,642 farms in this country, according to the 1960 farm census.

or more in a row. Cows also have a keen sense of hearing, being able to distinguish the sounds of different cars.

When a cow trusts a man completely, he can do things with her that she would not tolerate from any other person — even inflict pain on her. Granted that a certain amount of wildness is inherited, meanness is usually based on some unhappy experience out of the past, or unpleasant memory that only consistent kind-

ness will erase. For instance, only recently I was engaged to clip a herd. The present herdsman succeeded one who had been very abusive to the animals. I was warned about a certain dry cow that kept her eyes upon me all the time I was in the barn. I was told that the former herdsman could never clip this cow even when two men helped hold her tail straight up over her back; she would still kick straight out with both hind feet. I learned further that every time he milked her she would kick him and he would jab her mercilessly with a pitch fork till she was covered with blood. So she was never clipped.

I proceeded to clip the rest of the herd, leaving her go till last. I managed to pass her several times a day, each time stopping just long enough to speak to her — later, patting her across the rump. When the time came to clip her, I asked the man in charge to stand behind the cow and merely place his hand on her tail (I knew she would object to having it held straight up) and I started clipping very cautiously, making no quick motions. I finally finished except for some dried manure attached to the floor of her udder which I had at first decided to leave. Even under the best conditions, this can be a ticklish job. But this cow allowed me to remove every bit of manure and long hair from the bottom of her udder without raising a foot! Another secret I use is working close up against a cow, exerting reassuring pressure on her flank and placing my free hand across her back. Assume the attitude that you don't expect any trouble with a cow, and you'll be surprised to find she won't give you any.

Why Cows Sometimes Kick . . .

If cows kick, chances are something is wrong. Check their udder and teats for cuts, soreness, and chapping. Some have sensitive teats and are touchier than others. Handle these more carefully. They will never kick viciously, only to ask you to take it easy. Occasionally one may take a notion out of a clear sky to kick off the machine when your back is turned. Think nothing of it. Being a warm-hearted, affectionate creature, she may be wanting a little extra attention—or just "feeling her oats." Just like people, cows like to kick up their heels once in a while. Of course, if she persists in having her little fun like Julie,

The average expectation of life for the baby born in 1900 was 47.3 years. In 1959, life expectancy jumped to 69.7 years — the highest ever recorded.

Mrs. Mudgett's cow, you may have to make the coup de main (as Mrs. Mudgett finally nerved herself to do) to assure the cow —and yourself—that you are not afraid of her. One doesn't always have to speak to a cow before he enters her stall. A gentle hand is worth more than a dictionary of words. In fact a constant outpouring of words is a dead give away to the cow that you are scared.

In Julie's case I'm inclined to believe the cow thought she had her mistress buffaloed until she asserted her authority. Now women, I am certain, with their patience and sweet dispositions, make better cowherds than men, but once in a while they just don't seem formidable enough to the cow. Julie must have resented the nagging words: "So-o-o, Julie-girl good Julie! Easy. Julie-baby, nice girl! So-o-o Gr-r-r!" Cows like a little rough treatment at times, playful slaps and pinches—cave-man stuff—just to let them know they are loved. Don't ask me why; it's just a female whim. (Read O. Henry's "A Harlem Tragedy," a story that tells what happens when Maggie Fink decides to do something about her own drab marriage when she becomes envious of her friend, Mame Cassidy, who displays her black eye and bruised face, and boasts, "Ain't it a beaut? . . . I wouldn't have a man that didn't beat me up at least once a week.")

I knew a wise old cow, with a streak of roguishness in her, that would always raise her foot threateningly whenever the owner's wife washed her udder. The woman, completely cowed, never once entertained the idea of revenge. I told her to be just a little firm with the cow, just to show her that she wasn't afraid of her. Then, by way of demonstration, I'd walk over to the cow with a towel and slap it onto the floor of the udder, rubbing vigorously. And for good measure, I gave the old girl a hearty pinch just daring her to kick me. She loved it, and wouldn't think of giving me the satisfaction of raising her foot!

Organized in 1940 with six states, ADA now has active dairy farmer support in 48 states. The year 1960 registered the greatest investment to date.

Fallacies Have Persisted . . .

Of all animals, I think the cow has been the one most misunderstood and falsified. Man himself has what no animal has—a soul, a creative intelligence—he can use reason as a tool to dominate nature and environment, and this sets him off from the animal world. For this reason, he should

try to understand the cow and learn something about her, instead of beating her when she misbehaves. In his long association with her, man has probably learned less about the cow than she has about him.

Recently, this headline appeared in bold type in newspapers all over the country: "Cow Credited With Setting Pattern for 8-Hour Shift." The authority, a retired dairy company official, explained, "A cow grazes for four hours. The next four hours are devoted to the placid practice of chewing her cud. For this she must be stationary."

The very caption is not only misleading but it maligns the noble beast it describes. The dairy cow and the giant industry she maintains are a far cry to the 8-hour shift. Better credit her with keeping a 24-hour shift. But herein lies, perhaps, the historic truth of her nobility: She is content to serve the human race as its foster mother without taking any of the credit!

Actual scientific studies have shown that high temperatures depress overall grazing time and increase night grazing time and the number of times cows drink water. High quantity and low quality of available forage decrease grazing time and increase rumination time. When cows are allowed to graze a new area an increase in grazing time and a decrease in rumination time is noted. Cows receiving grain in addition to pasture show a decrease in grazing time compared with cows receiving no grain.

Rumination occupies a series of periods, usually of less than an hour in length, throughout the twenty-four hours. The amount of time spent ruminating varies with such factors as the fibrous properties of the diet and the availability of grazing; it frequently totals nine hours out of the twenty-four and, especially in grazing animals, is somewhat concentrated into the hours of darkness.

Feed grain production reached a record of 168 million tons in 1960, three per cent over 1959 and 23 per cent above the 1954-58 average.

Because of her placid nature, a cow prefers to indulge in this delightful task of regurgitation in a stationary position; however, this is not absolutely necessary as the authority would lead us to believe. I have turned many a business-minded cow out of the barn and she continued chewing her cud all the way out; even paraded a nonchalant animal in the show ring while she calmly chewed her cud, oblivious to the excitement about her.

The aforementioned news item goes on to say: "Then it is milking time. Off to the barn she

goes and after a night of sleep the whole eight-hour cycle starts again."

I will admit that most cows do know when milking time comes, but darn few hie themselves to the barn just like that. They would much prefer that you go after them or come only after you shout your head off. But if you are a few minutes late, they pretty soon and dead sure let you know about it.

The "night of sleep" bit really hit me, after I had certainly hoped that I had at least persuaded dairymen that cows never sleep. Wily, subtle creatures! With heads turned back restively at their sides and eyes closed, how many dairymen for how many years have been fooled into thinking them to be fast asleep! If cow men realized the truth they would never bring their cows in for the evening milking and then turn them into a bare, dry lot for the night, just so they will be handy for the morning milking. Knowledge of the same fact would save such costly experiments as the one tried with artificial lighting to increase production and feed consumption in the same manner as night lights have proved beneficial to chickens in increasing egg production.

"Cows cry just like humans," is another fallacy that has grown up around bovine physiology. Cows certainly have feelings, and they do have tears in their eyes. They are too satisfied with their lot to be sad so often as the presence of tears would indicate. The truth is, cows are not capable of expressing emotion on their faces. They have very active tear ducts, and I am inclined to believe this phenomenon of lachrymosity (described by poets as "bossy's liquid eyes") is associated with the cow's dewy muzzle—invariably considered by veterinarians and observant cow men as a sign of good health. It is a fact that a cow has but rudimentary sweat glands throughout her body and must perspire through her muzzle.

Again it has been said that a cow will eat nuts and bolts because she never spits out anything once she has taken it into her mouth. Some even go so far as to say that a cow is attracted by bright objects and hunts them out. This is untrue. Some individuals are such gluttons they do swallow foreign bodies without detecting them; but more often the herdsman, in sweeping mangers, discovers pieces of wire and nails left by the cows.

One pound of fine wool can be spun into 30 miles of yarn. A man's suit contains wool that could be spun into 100 miles of yarn.

Some Cows Are Very Intelligent

The cow is a very intelligent

beast, another fact that has escaped a great many people. The established theory of animal training is that a reward must be given immediately upon the performance of a trick, and it must be accompanied by a "bridging" signal, such as the ringing of a bell or a whistle—one that bridges the time lag between the earning of a reward and the receiving of it. When this is done properly, your command is firmly hooked into the animal's nervous system and becomes the starter in its motor. The bridging signal theory of conditioned reflexes can best be illustrated by the simple routine of a cow's letting down her milk when she hears the rattling of milk pails, the turn of a crank of the automatic feeder in the milking parlor, etc. From your own experience you know the anticipation of refreshment on hearing the tinkle of ice in a glass.

Directly west of Carroll, Iowa, on old Highway 30 is one of the most unusual cows in the country, certainly. She is a five-year-old Jersey named "Cookie," owned by Ted Reiling. Cookie, the Bovine Wonder, does many tricks well and has learned them not by the conventional method of granting a reward, but merely by her owner's asking her to do something. She will walk, trot, canter, and pace just the same as the finest pony; she will make a full stretch and a back-up; hop onto a 28-inch diameter stool and gracefully execute a complete turn to the left and a complete turn to the right: and shake hands and bow. But when it comes to playing sick, Cookie is master of all. This showgirl will lie on her side, stretch full length and flat against the ground, then moan and groan as if in terrific pain.

What is the secret of Cookie's uncanny ability? Animals derive great satisfaction from achieving what they have been trained to do, the same as we do. Cookie knows it is her job to perform tricks the same as the average cow gives milk. She becomes so anxious to get into the trailer to be off to another show at the sound of the car's motor starting up that she gets very excited. Cows get the same satisfaction from giving milk to the herdsman who will slap her affectionately across the rump when taking the milker off.

The average farm work day in the United States is 10.6 hours. Farm operators average about an hour more each day than their hired hands.

About ten years ago while vacationing in Mt. Home, Arkansas, I heard the clink-clank of a cow bell ringing out on the still air of a spring morning. It was Bossy's bell (Bossy was a cream-colored Jersey) that I heard as

she led three younger heifers to the hill pasture below "Mockin' Bird Hill." I discovered afterwards that this cow did this every morning as soon as milking was done. She would keep to the side of the road, never walking in the middle, and make a B-line to the grazing lot about half a mile from home, neither looking to the right or left, and stopping for no man, beast, or automobile. Then each night when milking time came, without any prompting, Bossy could be seen and heard leading her charges up the hill back to the barn.

The differences in intelligence among cows are as great as those among human beings. This is fascinating and rewarding work, understanding dairy animals. A little knowledge of their behavior and habits will make us better and richer dairymen—richer financially and spiritually. More efficient production can be attained by knowing more about the temperament of the cow and by catering to that temperament. Though herds will become larger, be assured that the better breeding stock of the future will continue to come from those herds whose owners believe in and practice the abiding philosophy of individual care and attention.

If you did not know it before and if you learned nothing else, you would realize that all life is holy. The thrill of communication and finding understanding is multiplied many times because you are reaching out across a great void. When you make the contact you discover that the humblest creature is as wise as you are, but of course about different things; and you experience a keen thrill of indescribable, priceless, and almost unbearable wonderment.

Cow Stairs, Not Ramp

—Rutgers University

To get cows from one level to another, in and out of milking parlors or from yard to a higher barn level, use steps instead of an inclined ramp. That's the advice of W. C. Krueger, agricultural engineer at Rutgers University.

A roughened ramp surface is no guarantee that a cow will not slip on mud or sleet; injury is not uncommon. Cows seem to manage steps much easier.

A rise of 8 inches to every 3 feet of run has proven quite satisfactory although shorter runs and higher risers have successfully been used. Steps take less horizontal room and are safer than ramps.

Chimney Smoke

by Irene Rudie

Time is like money,
The less we have to spare,
The more precious it is,
And we spend it with care.
Adeline Roseberg

★ ★ ★

A coming improvement in telephone service, they say, will allow a third person to join an existing telephone conversation. That's nothing new on our party line!

★ ★ ★

It took a small child to point out that it was the biggest pig in the nursery rhyme (the middle finger) that got the roast meat.

★ ★ ★

Anyone who does more patching than I do is stingy, and those who do less are extravagant—or lazy!

★ ★ ★

The Lombardy poplars, still holding on to their leaves, stand in our neighbor's yard like tall candles to warm the leafless elms and boxelders.

★ ★ ★

The old farmer listens to the radio weather forecasts and watches the TV weather map. Then he goes outside to study the sky and feel the wind, and makes his own forecast, often the accurate one.

I am convinced that all the men of the world belong to a secret society, and its first rule is this: Never hang up a garment or close a drawer!

★ ★ ★

If you think a cradle baby doesn't work hard, just try one of his exercises when you have nothing to do. Lie on the floor and raise both legs to a vertical position a couple of hundred times. You won't last ten times.

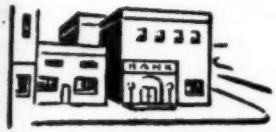
★ ★ ★

For an easy poppy seed cake, add three tablespoons of whole poppy seeds and two tablespoons melted butter to any white cake mix. Mix and bake as directed and ice with white or chocolate frosting.

★ ★ ★

A man doesn't mind spending hours to catch a few fish, why, then does he object to spending a few more minutes cleaning them?

How To Establish A Farm Credit Rating



Credit is an essential farm tool. Establish a credit rating so you can use it when needed in your operation . . .

Condensed from Solutions

H. A. Lathrope, Agronomist, Allied Chemical Corp.

BORROWED money —credit —has become a general and a most important factor in the average farm operations.

Successful young farmers, as well as middle-aged farmers have long considered establishing a sound credit reputation as one of the factors aiding them in a successful farming operation. Young farmers just getting started, as well as established farmers, need considerable credit every year. Farm income is oftentimes seasonal and does not leave enough cash on hand for a successful farmer to operate his farm with reasonable efficiency.

1. Successful farmers borrow money for production purposes. Many farmers borrow money for the purchase of new machinery, labor saving devices, new buildings, or for fertilizer to increase their farming efficiency and annual profit. Bankers will usually be more than willing to extend credit if they know that farmers are asking to borrow money for a good investment in their farming operations.

2. To establish credit, successful farmers often maintain a satisfactory checking account in a local bank. Successful farmers have the ability to save money. These are two factors which are immediate indications to a banker of a farmer's managerial ability.

3. Successful farmers keep accurate records. Your farm records will show whether or not you are making financial progress. Successful farmers know the value of their assets and have a complete list of their liabilities.

4. Successful farmers discuss their financing plans with their banker. This should be done fre-

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quently. Farmers know this discussion is confidential. A banker, to be of the most assistance, must know a farmer's complete financial situation. A successful farmer discusses the type of loans, repayment plans, and credit costs to secure the best credit available for any particular farm situation.

5. Successful farmers do their financial shopping or their financial business in one place. By doing this, they establish a credit reputation which can be achieved much more rapidly if all financial transactions are done with one local, commercial bank.

6. A farmer's financial progress is reflected by his financial transactions at his local bank combined with the on-the-farm visits by the banker who can foresee a farmer's ability to make a profit in his farming operations. A man's ability to make a profit is the most single important factor effecting the amount of credit available to a farmer today.

7. Successful farmers live up to accepted standards in their community and take part in the civic and community affairs which brand them as solid citizens and good risks.

8. Farmers with a good credit rating and possessing the ability to make money can often times avail themselves of the opportunity of making many financially sound purchases because they have adequate available credit.

9. Fertilizer, or plant nutrients, do not offer collateral opportunities such as machinery, automobiles, refrigerators, furniture, and land. Often times young men need credit for fertilizer or plant nutrients who do not have chattel or collateral to offer as guarantees of their loans. Accurate records, good reputation, thorough knowledge of the business will usually offer a banker sufficient information to enable him to make a fertilizer loan.

10. Bankers are in the business of loaning other peoples money. They have a firm responsibility to collect the money which they loan on time and with interest-profit so that they can reloan the money to other successful borrowers. The use of money has long been a profitable transaction for both borrower and lender.

Pruning young forest plantings "as long as you can reach the branches with a pruning hook" assures clear, straight trunks, and provides a better timber crop, says E. P. Farrand, extension forester at Penn State. The trees, he adds, should be pruned down to one vigorous leader for development of a longer main trunk.

FUN ON THE FARM

A Collection of Jokes and

Humorous Farm Stories

Two tramps beseeched an Indiana farmer for a handout. "Fill that shed with kindling wood," proposed the farmer, "and you'll get the best meal you've et in weeks."

The tramps were hungry — and there wasn't another house in sight, so they reluctantly accepted the farmer's offer. Fifteen minutes later, the farmer went out to the shed to see how they were progressing. He found one tramp leaning on the ax handle while the other tramp executed a series of amazing ballet steps, flipflops and somersaults.

"Cricky," said the farmer to the tramp on the sideline, "I didn't know your friend was an acrobat."

"Neither did I," admitted the tramp, "until I cracked him on the shin with this ax. —*Midland Cooperator*

★ ★ ★

Middle age is when you quit reading self-improvement books, figuring you'll be lucky just to hold your own the rest of the way.

★ ★ ★

God expects us to do more than pray. We must also help our prayers to be answered. Here is how one little girl did it: Her brother had made a trap to catch sparrows, and she prayed that it might fail. For three days she prayed hard, and she was sure her prayer would be answered. Finally her mother asked one morning, "Julia why are you so sure your prayer will be answered?" The little girl replied: "I know it will be answered because I went out there three days ago and kicked the trap to pieces." —*The Ohio Farmer*

★ ★ ★

Don't itch for anything unless you are willing to scratch for it.

★ ★ ★

The fallout, I sigh,
That causes me dread
Isn't stuff from the sky,
It's hair from my head.

★ ★ ★

The dairy department of Michigan State University has, in its spare time, been adding to the collection of notes in milk bottles. Some of these gems printed recently were:

"Dear Milkman: Please say hello to the dog so he won't bark so much, maybe. . . ."

"To Mr. Milkman: Please come earlier every time you come because we go to school."

"Milkman: Do not leave any milk today. My wife had a baby boy. Thank you very much. . . ."

"Beginning today please leave just ½ pint cream the first two deliveries during the week and the third delivery leave cream and a quart of milk. In other words leave cream only on all deliveries except on weekends when you are to leave a quart of milk also for Sunday. If this isn't clear please knock and I'll explain." —*Certified Milk*

★ ★ ★

Some people's idea of heaven is 1951 wages, 1932 prices, 1926 dividends, and 1910 taxes. —*Wisconsin State Journal*

★ ★ ★

The young farmer was telling his city aunt that the best thing to use for flowers is manure.

The aunt replied, "Please Henry, around here we call it fertilizer."

Henry's answer was a shocker; "Easy Aunt Hazel," he said, "it took us three years back home to get them to say manure."

★ ★ ★

It has been told that it gets so cold up in New England that a chicken was seen walking down the street with a capon.

★ ★ ★

City boy (watching farmer milk cow in a cold barn): "Why don't you put anti-freeze in the cow's radiator so you wouldn't have to drain her so often?" —*Marlene Geisler, Pleasanton, Nebraska*

★ ★ ★

Think of the crops we'd grow if the fertilizer salesman's goods were half as rich as his conversation. —*The Farmer Stockman*

★ ★ ★

Overheard at a sales barn forum: "Things are picking up. Last week they picked up my combine and cultivator, tomorrow they're picking up my car. At this rate I'll soon be out of debt." —*Missouri Ruralist*

★ ★ ★

Old lady (sniffing) — "What's that odor I smell?"

Farmer — "That's fertilizer."

Old lady (astonished) — "For the land's sake!"

Farmer — "Yes, Mam." —*E. Carlson, St. Paul 2, Minnesota*

★ ★ ★

Shotgun wedding: A case of wife or death.

★ ★ ★

A bar patron whispered to the bartender that a monkey who was sitting on a pickle barrel playing a harmonica had his tail hanging in the barrel.

The bartender replied, "Don't bother me with it. Go tell the monkey."

Whereupon the patron approached the monkey and said, "Do you know your tail is hanging in the pickle barrel?"

"I don't know," replied the monkey, "hum a couple of bars and I'll see if I can pick up the melody." —*Holstein Friesian World*

★ ★ ★

About the only thing that will now give you more for your money than ten years ago — is that penny scale at the drug store.

★ ★ ★

A cameraman, working for the educational department of a film company, met an old farmer in town and said:

"I've just been taking some moving pictures of life out on your farm."

"Did you catch any of my men in motion?" asked the old farmer curiously.

"Sure I did."

The farmer shook his head reflectively, then commented: "Science is a wonderful thing." —*The Dairy Plant Fieldman*

★ ★ ★

Speaking of tranquilizers, even back in grandpa's time there was something to make you sleep. They called it work!

★ ★ ★

The Yankee farmer, after seven years of effort on his stony New England farm, announced to all: "Anyhow I'm holdin' my own. I didn't have nothin' when I came here, and I ain't got nothing now." —*Contributed by E. Carlson, St. Paul 2, Minnesota*

★ ★ ★

In a small town, the sheriff was also the vet. Late one night he received a frantic phone call, "Do you want me as sheriff or vet?' he asked.

"Both," came the reply. "We can't get our dog's mouth open . . . and there's a burglar in it!" —*Texas Farming and Citriculture*

★ ★ ★

Sometimes out of the mouths of young people come words their parents should not have spoken.

★ ★ ★

A farmer living on a state highway became thoroughly disgusted when he had to repair his fence for the third time in less than a week because travelers drove too fast to get around a bend in the road. So he made a sign and erected it in the curve: "Please drive carefully through the fence." —*A true story contributed by Roy H. Dingle, Richland Center, Wis.*

★ ★ ★

It's not the scent of the hogs
That disturbs me,
Nor the noise of the calves
that perturbs me:
It's those ever-bleating ewes
That'll make me blow my fuse!
—*Joan Gaily in Capper's Weekly, Contributed by Mrs. Mirian Grove, Rt. 1, South English, Iowa*

★ ★ ★

Really now, isn't the most curious thing in the world a woman who isn't?

★ ★ ★

A tomcat and a tabby cat were great friends on a back fence. The tom leaned over and said to the tabby cat, "I'd die for you!"

The tabby gazed as him, lowered her eyelids, and purred, "How many times?" —*Mrs. Stella Riley in The Progressive Farmer*

★ ★ ★

Do you suppose dogs ever worry about going to the people?

★ ★ ★

A lion was roaming through the jungle and came upon a bull. He pounced on the bull and ate it. Afterwards, he started to bellow with contentment. Then a lion hunter came upon the lion and shot him.

Moral of the story: *When you're full of bull, keep your mouth shut. —Jim Lorenz in The National Future Farmer.*

★ ★ ★

Success is 98% perspiration and 2% inspiration.

★ ★ ★

The wife was terribly jealous. Evening after evening she subjected her husband to a searching inspection; if she found a single hair on his coat there would be a terrible scene. One night she found nothing. "So!" she screamed. "Now it's a bald-headed woman!" —*The Lion*

★ ★ ★

Little Mary took a stroll in her grandparent's garden and saw a peacock strutting. Running back to the house, she shouted, *"Oh Granny, come look! One of your chickens is in bloom!" —Robert Weideman in the National Future Farmer*

★ ★ ★

When the pioneers settled this country, the Indians were running it. There were no taxes, no national debt, and the women did all the work. And the pioneers thought they could improve this system? —*The Ohio Farmer*

★ ★ ★

A small farm boy, waiting in the beauty shop for his mother's hair to dry, walked impatiently over to her and said, "How much longer will you be under the brooder?"

★ ★ ★

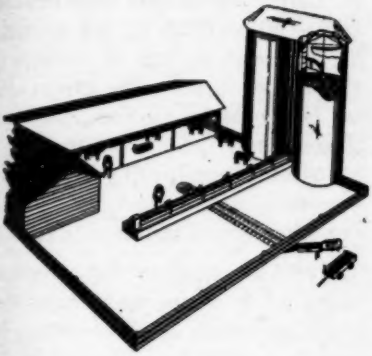
A western sheriff confiscated a bunch of slot machines on the basis of a law banning the use of steel traps for catching dumb animals.

★ ★ ★

A recession is a period when you tighten your belt. In a depression you have no belt to tighten, and when you have no pants to hold up it's a panic.

Contributions for this page are welcome. Send your "Fun On The Farm" story to Farmer's Digest, Fort Atkinson, Wisconsin.

Six Features For Feedlot Design



Follow the six steps in this guide to design the feedlot for your cattle feeding operation . . .

Condensed from

The Country Guide

THE kind of feedlot you build will likely depend, in part, on what building materials are available, the slope of the land, and the convenience of feed supplies.

These influences are variable, and there are others, but Dr. C. M. Williams of the University of Saskatchewan has drawn up the following list of certain aspects of feedlot design to serve as a guide for the new cattle feeder.

Drainage. A substantial slope is desirable where possible. Flat land can be bulldozed into a hill, which will be a dry knoll in wet periods, or it's possible to bulldoze out a gully to drain off heavy rains or melting snow. Cement or timber aprons in front of feeders and water troughs are well worth providing. They are easy to make.

Feeding. Preparation and distribution of feed takes the largest portion of labor in a feeder cattle operation. Some system of dropping or augering feed grains into grinders and trucks is desirable. Mechanical distribution into troughs by augers or belts is most practical in medium operations of 100 to 500 head. Smaller operators should watch overhead and investment per head, and will often choose self-feeding because it may need less daily attention and will thus conflict less with other farm operations. Larger operators usually choose hand feeding, because it gives slightly higher efficiency in use of feed and better control of feed composition and quantity.

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The Country Guide, 1760 Ellice Avenue, Winnipeg 12, Manitoba, Canada

Trough space increases from 6 in. per head to 2 ft. per head, depending on age of animal, the presence or absence of horns, and whether you are using the hand-fed or self-fed method.

Watering. In winter, 6 gallons of water, and in summer, 20 gallons per steer per day, must be available. Water is more easily provided and warmed in one large rather than several small tanks. Location of pens to allow watering at one point is worth considering.

Shelter and Bedding. The chief shelter needed is a windbreak, using trees and hills where available, but usually a board fence is necessary. There is some doubt whether overhead shelter is any advantage where snowfall is low. Adequate bedding in a restricted area is essential to provide a manure pack for the animal's comfort and warmth.

Pens and Space. Very small feedlots should provide a total area per steer approaching 90 sq. ft. Larger operations may reduce this to 60 or 70 sq. ft. per animal. If overhead shelter is provided, the space is normally about 30 sq. ft. per steer. Crowding under shelters may defeat their purpose by causing overheating and high humidity, with subsequent chilling when steers move outside.

Even the smallest farm feeder will find it useful to have more than one pen. Some sorting is usually needed for different feeding rates. As the operation increases in size, each pen increases in capacity to a maximum of 200 or 300 head, and the number of pens increases to 3 or 4 to handle cattle in groups which will represent the various stages of finishing.

Equipment. A loading chute, a squeeze and a small holding pen are essential. It's useful to have a small pen and shed for sick animals. A scale suitable for weighing feed and cattle will soon pay for itself.

Don't skimp on use of fertilizer, urges an extension agronomist, because soil fertility represents one of the best investments farmers can make. Those who try to save money by buying less fertilizer reduce their income faster than they cut out-of-pocket costs.

"The picture of government, as I see it, is of a gigantic Santa Claus, and we're dancing around the Christmas tree, hoping for our presents. But each package is marked in fine print, so we don't have to read it, "You don't have to pay for this, but your grandchildren will."

—Dwight D. Eisenhower

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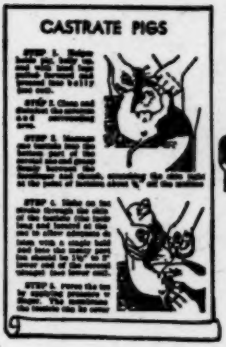

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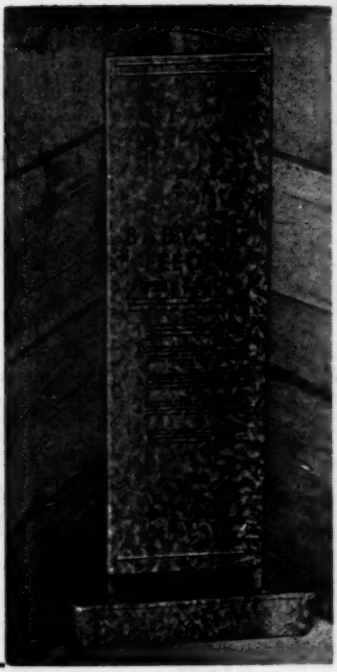

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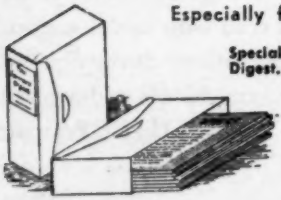

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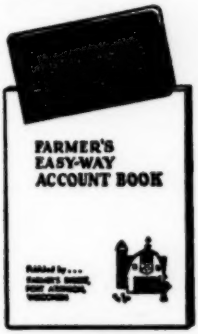

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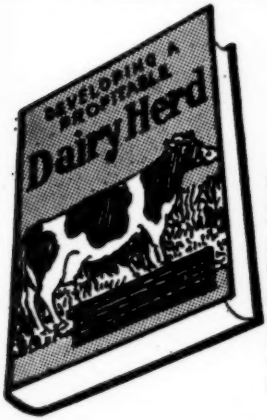

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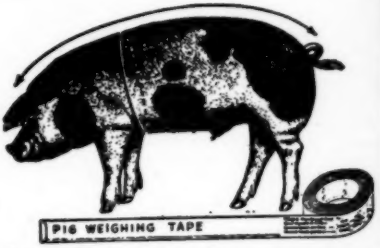

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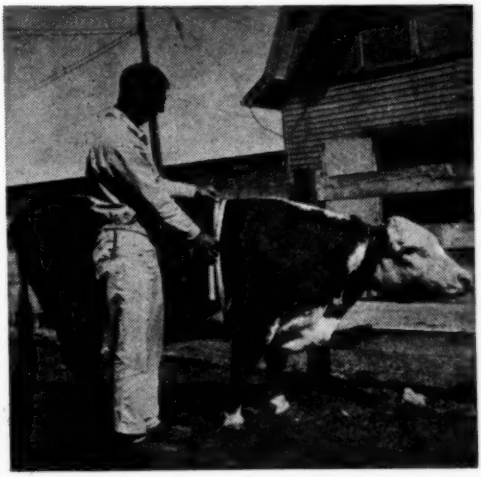

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